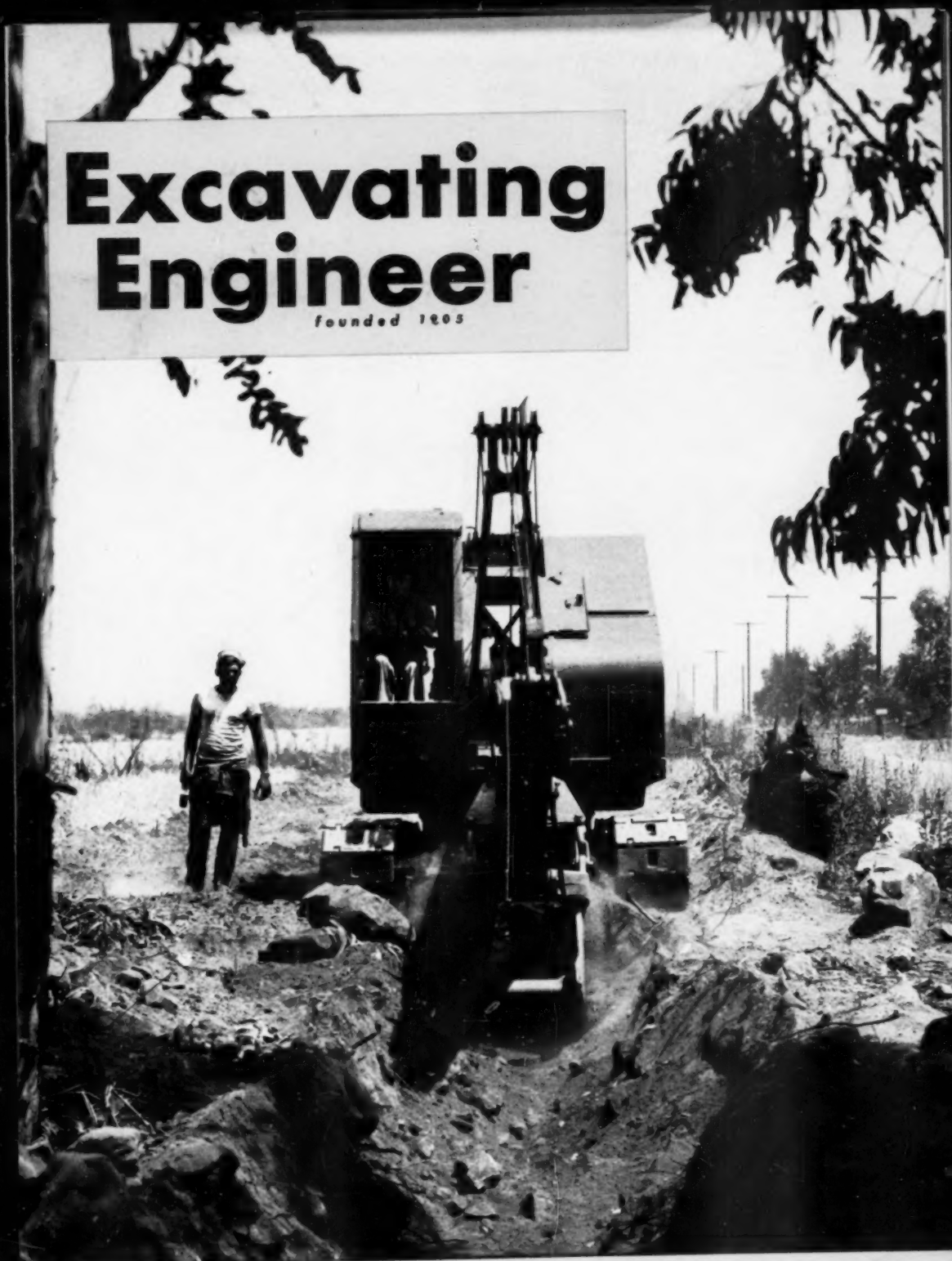
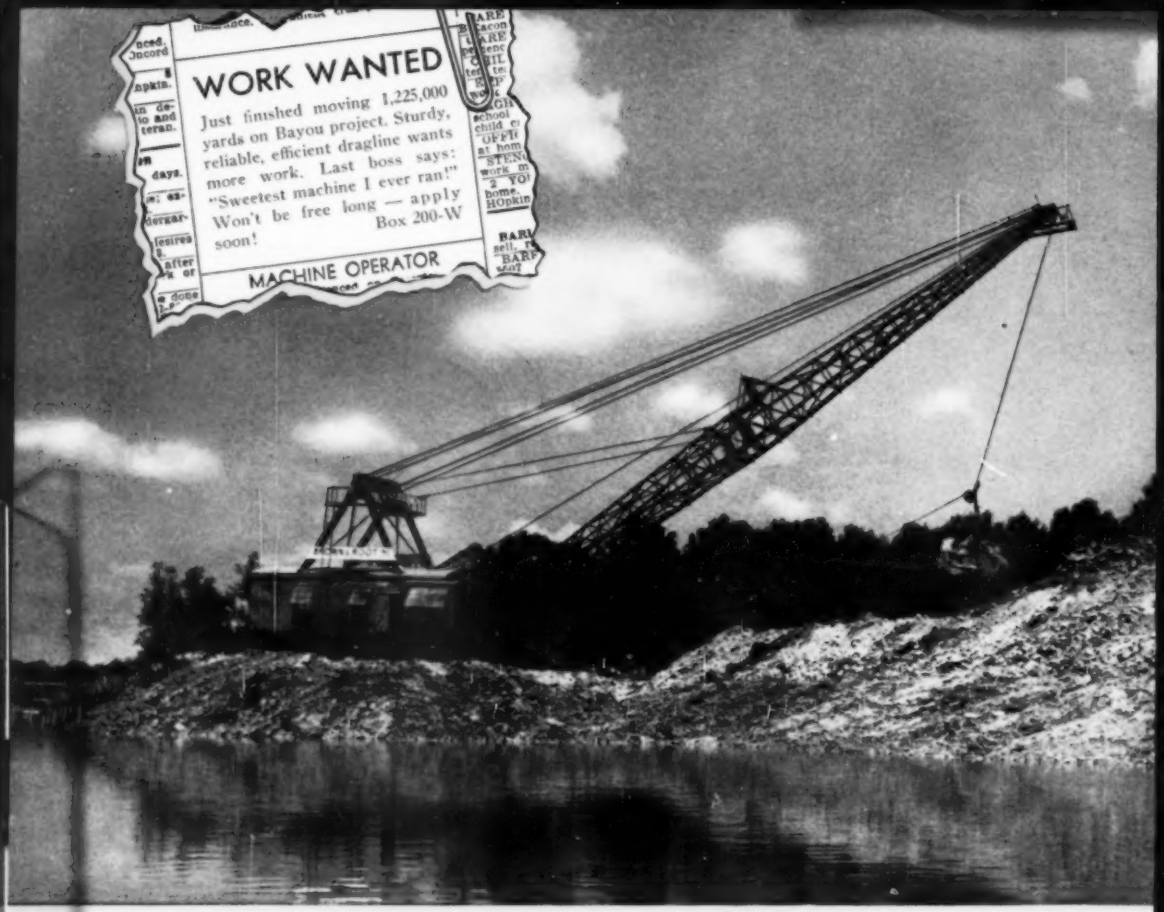
Excavating Engineer

founded 1905



• A ½-yd. dragshovel owned by Roy Arnold and John Poether, Azusa, Calif., excavates water main trench through boulder-strewn earth near Upland, Calif.

February 1949


WORK WANTED
Just finished moving 1,225,000 yards on Bayou project. Sturdy, reliable, efficient dragline wants more work. Last boss says: "Sweetest machine I ever ran!" Won't be free long — apply soon! Box 200-W
MACHINE OPERATOR

No Idle Hours for This Worker!

Widening and deepening a Texas bayou, this Bucyrus-Erie 200-W walking dragline excavated 1,225,000 yards of sandy loam — almost half of it dug under water. Despite numerous moves and soft footing, the 200-W compiled a consistently high daily output average — the kind of record that is familiar to 200-W owners everywhere. They know from experience that its strong, simple construction means dependable performance with minimum time out for maintenance when far from service facilities. They know, too, that the 200-W's fast cycle, great operating range, exceptional stability and maneuverability enable it to deliver the consistently high output they need. Proper weight distribution, smooth walking mechanism and easy control all contribute to outstanding production records wherever this versatile walker goes to work. Boom lengths on larger machines up to 250 feet; bucket capacities to 25 cubic yards.

BUCYRUS ERIE

SOUTH MILWAUKEE, WISCONSIN

33M49C

The Best Buy Bucyrus . . . The Best Buy In Excavators

DAY in and day out, more and more yards are moved on Goodyear Earth Mover All-Weather tires. Experienced equipment operators know that this great tire is *right* for rolling yardage — right on schedule at rock-bottom cost!

Designed to carry maximum loads over all kinds of terrain, the large diamond pattern of the Earth Mover All-Weather distributes the load evenly to the carcass. The rounded diamonds reduce cutting and snagging, and the flat wide tread gives maximum flotation in soft going and even wear on firm surface roads — the nearest to an all-purpose tire that can be built.

That's why Earth Mover All-Weather tires — like *all* Goodyear work tires — are first choice with users everywhere. They stay *first* choice year after year because they keep on delivering low-cost, long-life performance.

This tire moves the earth on time!

EARTH MOVER SURE-GRIP for maximum traction on drive wheels

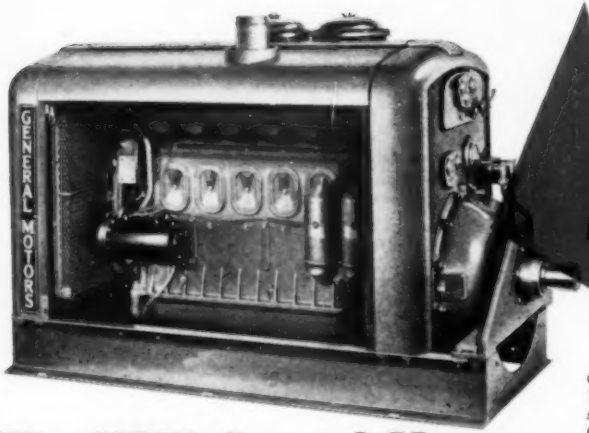
HARD ROCK LUG for super-stamina in all rock work

We think you'll like "THE GREATEST STORY EVER TOLD"—Every Sunday—ABC Network

GOODYEAR

All-Weather, Sure-Grip—T. M.'s The Goodyear Tire & Rubber Company

MORE YARDS ARE MOVED ON GOODYEAR OFF-THE-ROAD TIRES THAN ON ANY OTHER KIND

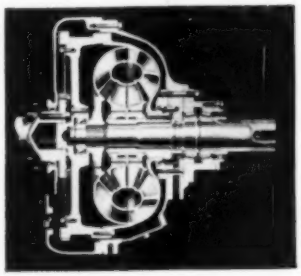


A Combination Torque Converter and Fluid Coupling *Integral with the Engine*

General Motors 71 Diesels equipped with the new GM Torque Converter take up no more space or weight than the same engines with conventional friction clutch and power take-off. Available in 3-, 4-, and 6-cylinder single engine units, Twin 4 and Twin 6 models having engine ratings from 75 to 300 H.P.

The NEW General Motors DIESEL ENGINE-TORQUE CONVERTER UNIT

HERE is a complete, integrated Diesel engine-torque converter unit that combines the inherent efficiency of the GM 2-cycle Diesel engine with the features and advantages of *both* torque converter and fluid coupling. It provides *torque multiplication up to 4 to 1* for starting variable heavy loads. It also provides *highly efficient transmission of power* during light load periods by *automatically shifting to fluid coupling* in the upper speed range.



In the new GM Torque Converter, oil does the work. Automatic transition from torque multiplication of 4:1 at stall to 1:1 in upper speed range.

A smooth, uninterrupted flow of power, delivered through a liquid, *prevents engine stalling* under any load and *protects both engine and driven machinery from sudden shocks.*

One Manufacturer—One Responsibility

Up to now most engines and hydraulic drives have been separate units. The result—compromise designs and divided responsibility. Now General Motors offers a new torque converter specifically designed and manufactured as an integral part of the General Motors Series 71 Diesel engine. It is a self-contained unit built by one manufacturer providing a long needed saving in space and weight as well as certain desirable operating characteristics not available before.

This new power unit will get the most work done in the least time because the engine operates in its most efficient speed range at all times—delivering maximum engine horsepower regardless of the speed of the load. *Maximum torque to start heavy loads PLUS maximum horsepower to keep the load moving.*

Everyone with a hard job to do in the oil fields, in construction, in mining or in logging should have all the facts about this compact, flexible GM Diesel Engine Torque Converter unit. *Write today for a complete description.*

DETROIT DIESEL ENGINE DIVISION

SINGLE ENGINES . . Up to 200 H.P. **DETROIT 28, MICHIGAN** MULTIPLE UNITS . . Up to 600 H.P.

GENERAL MOTORS

DIESEL BRAWN WITHOUT THE BULK

GM GENERAL MOTORS DIESEL POWER

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Excavating Engineer

founded 1906

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Describing fractional-second spacing of blasts by means of an electric-motor-powered blasting switch. In two years' use at quarries of the New York Trap Rock Corp., a switch developed by the author has fired over two million pounds of explosives with a record of vastly improved fragmentation and reduced vibration.

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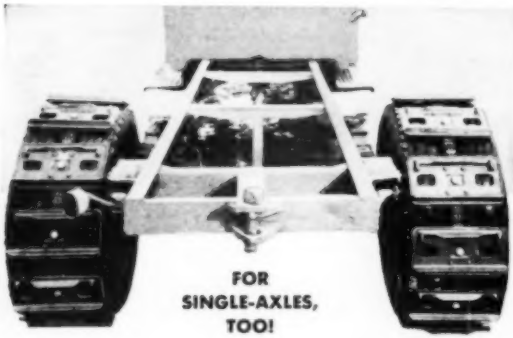
Beat Mud with TRUCK TRACKS



Standard Single-Axle Set gives up to 300% more traction surface, fits tires up to 9:00 x 20. Only $145 plus freight. Additional pads to fit larger tires available at $6.50 each.

Standard Tandem-Axle Set gives up to 500% greater surface contact, fits tires up to 11:00 x 20. Only $285 plus freight. Additional pads to fit larger tires available at $6.50 each.

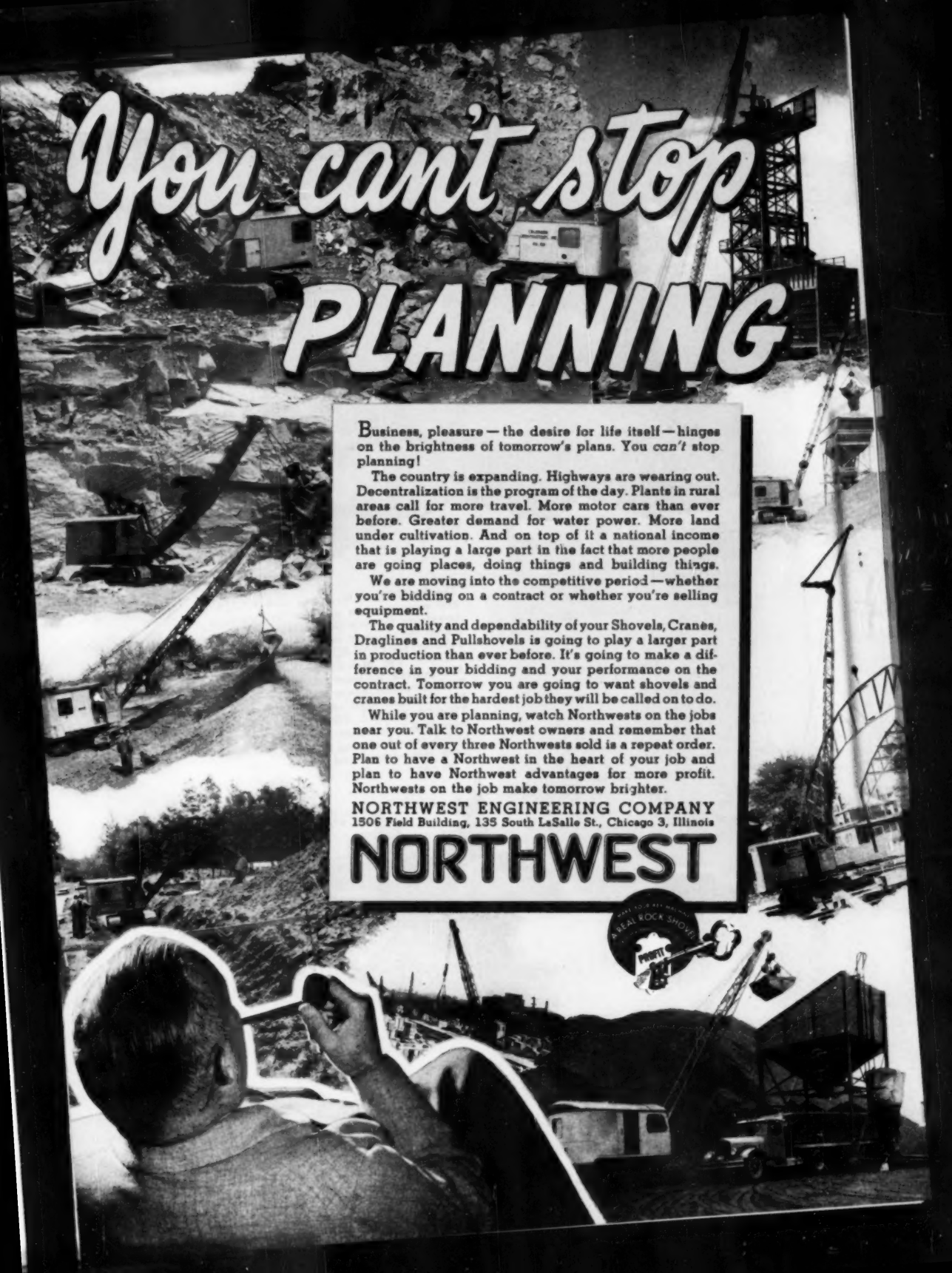
If mud or snow curtails your winter hauling, TRUCK TRACKS are the answer. TRUCK TRACKS are keeping hundreds of vehicles on the job this winter, and they can keep yours producing as never before.

TRUCK TRACKS greatly increase mobility of single and tandem-axle trucks fitted with most standard duals. Mounting and demounting takes mere minutes . . . can be done by the driver alone. Maintenance is negligible, repairs are nil on all-steel TRUCK TRACKS. Positive traction on all drive wheels. No sprockets or other accessories to buy.

To order TRUCK TRACKS, specify tire size and whether tandem or single-axle set is required. Accompany order with a $50.00 deposit per set for immediate C.O.D. shipment. Write or wire today.

P. & G. SUPPLY CO.

615 S. E. Market St. Portland 14, Oregon


You can't stop
PLANNING
Business, pleasure — the desire for life itself — hinges on the brightness of tomorrow's plans. You *can't* stop planning!
The country is expanding. Highways are wearing out. Decentralization is the program of the day. Plants in rural areas call for more travel. More motor cars than ever before. Greater demand for water power. More land under cultivation. And on top of it a national income that is playing a large part in the fact that more people are going places, doing things and building things.
We are moving into the competitive period — whether you're bidding on a contract or whether you're selling equipment.
The quality and dependability of your Shovels, Cranes, Draglines and Pullshovels is going to play a larger part in production than ever before. It's going to make a difference in your bidding and your performance on the contract. Tomorrow you are going to want shovels and cranes built for the hardest job they will be called on to do.
While you are planning, watch Northwests on the jobs near you. Talk to Northwest owners and remember that one out of every three Northwests sold is a repeat order. Plan to have a Northwest in the heart of your job and plan to have Northwest advantages for more profit. Northwests on the job make tomorrow brighter.
NORTHWEST ENGINEERING COMPANY
1506 Field Building, 135 South LaSalle St., Chicago 3, Illinois
NORTHWEST
A REAL ROCK SHOVEL
PROFIT

. . . WHY NOT *Switch* to RUBBER . . .

Don't SWITCH TO COSTLY SINGLE-PURPOSE RUBBER

ROUGHING IN . . . and similar very bad operating conditions, cutting side slopes etc. make the crawler and scraper mandatory.

DRESSING THE FILL . . . while the crawler tractor and scraper is being used for roughing in, the versatile M-R-S "125", because of its high drive axle weight and soft, low pressure drive tires with 14 pounds air pressure, can be used for dressing the fill and pulling sheepsfoot rollers.

The SWITCH between the M-R-S "125" and your crawlers provides unparalleled versatility to help you make profits against the toughest competition . . . PROFITS WITH LOW EQUIPMENT INVESTMENT. The M-R-S "125" is the perfect partner for your crawlers . . . it offers versatility never before possible in heavy rubber tired equipment. INVESTIGATE BEFORE YOU INVEST! See your M-R-S dealer or write direct to the M-R-S Manufacturing Company for complete information and specifications.

SWITCH

SWITCH

★ M-R-S MANUFACTURING

hat will *Switch* with your CRAWLERS

Switch to the VERSATILE M-R-S "125"

Axle Weights (Empty)	16,400	7,094
Axle Weights (Loaded) Using M-R-S Patented Weight Transfer	28,400	7,094

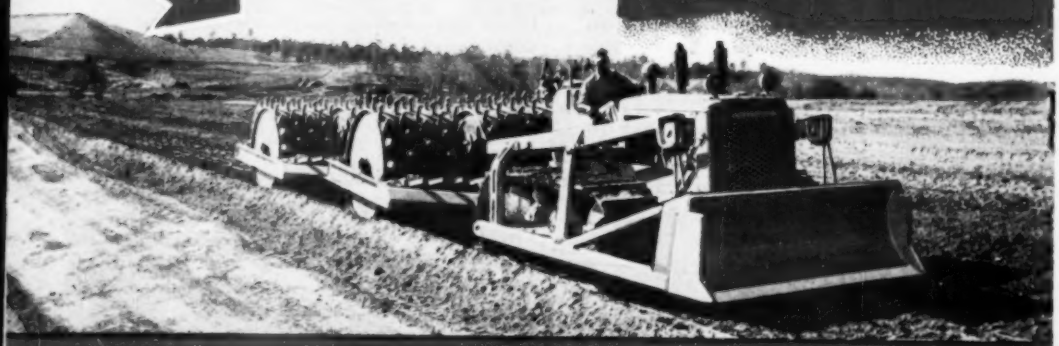
SWITCH

SWITCH

The M-R-S "125" is the prime mover of many uses. Use it with the patented weight transfer for hauling and scraper operations. Use it for dozing, compacting, plowing, with blade graders, with two wheel hydraulic scrapers, and general all-round drawbar work. Once you've seen it work you'll recognize the profits it can make for you.

SCRAPER WORK . . . The normal tractor drive axle weight of 16,000 pounds, together with the low pressure drive tires, gives adequate tractive ability for good operating conditions.

For assisting the crawler pusher to load a four wheel scraper and negotiating bad operating conditions, the M-R-S weight transfer provides adequate traction by instantly transferring 10,000 to 12,000 pounds or more to the tractor drive axle at the will of the operator, thereby making it possible to use the conventional four-wheel, scraper of most any standard make normally used behind a crawler tractor.



COMPANY FLORA and JACKSON, MISSISSIPPI U.S.A.

Sometimes it pays to see double

When you put two Bucyrus-Erie shovels on the job, for instance. It's a case of seeing smooth action, unequalled dependability, steady top-flight output — *multiplied by two.* That's duplication that puts money in your pocket.

These days it's easy to find two or more of these outstanding machines teaming up to whip tough jobs in record time. Experience with one Bucyrus-Erie quickly convinces owners that it pays to duplicate such efficiency. This is the secret of Bucyrus-Erie's high percentage of repeat orders — especially among the leading users of excavating equipment.

Check into this ⅜- to 2½-yard line of shovels, draglines, cranes and dragshovels. You'll find that for steady big output in rock or dirt, your best buy is Bucyrus.

BUCYRUS ERIE

The BEST buy Bucyrus, the best BUY in excavators

Bucyrus-Erie Company

South Milwaukee, Wisconsin

Born to the Service!
EASTON MODEL TRB
QUARRY TRAILERS
A natural favorite in quarries throughout the world. Model TRB-10, illustrated, is rated at 14 tons capacity. Other TRB capacities up to 20 tons. Dumped by EASTON air or electric overhead hoist. Built for years of heavy duty.
DOORLESS • TWO-WAY • SIDE-DUMP
EASTON

Consider the LOW COST!

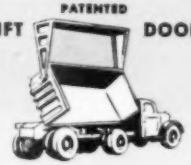
Special purpose design strips cost to the essentials for specialized service. That's why haulage costs are so extremely low with EASTON Special Purpose Trailers. Engineers who know quarry haulage intimately will gladly provide full information, transportation survey and cost estimates on an EASTON Trailer system for your property. Write to Easton Car & Construction Company of Easton, Pa.

B-1032

PATENTED
DOORLESS PAN

Model TRB · 14 to 20 tons

PATENTED
LIFT DOOR



Model TL · 20 to 30 tons

PATENTED
DROP DOOR

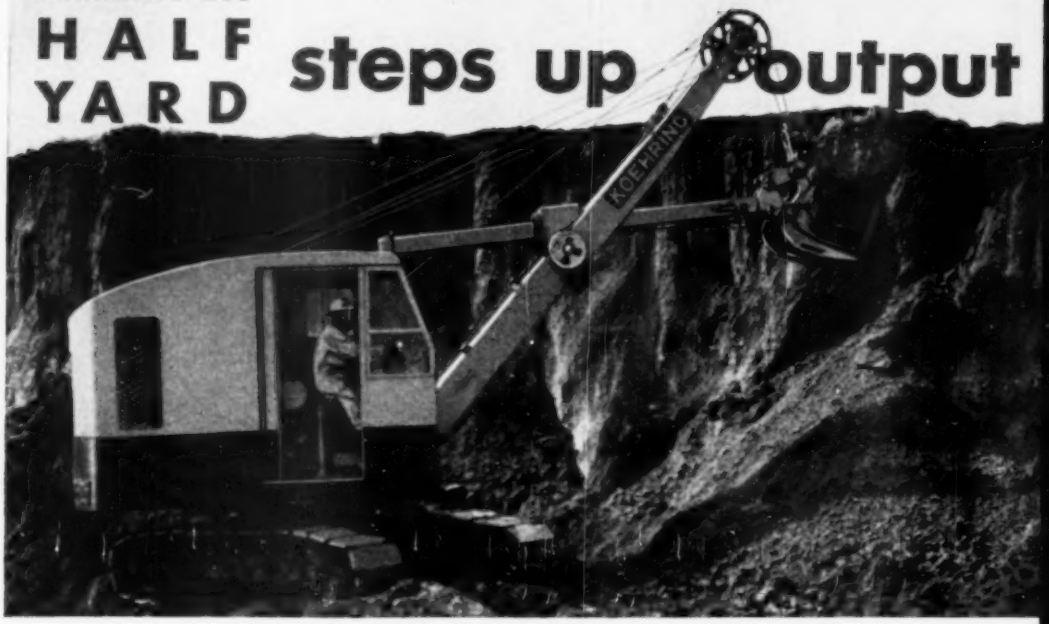
Model TD · 20 to 30 tons

SPECIAL PURPOSE
EASTON
Trailers

Makers of Easton Mine and Quarry Cars and Easton Heavy-Duty Truck Bodies

KOEHRING 205

HALF YARD steps up output



1 CHAIN DRIVE gives fast crowd and retract

On the Koehring Heavy-Duty, Half-Yard shovel, chain drive gives fast crowd — 84' per minute . . . fast retract—143' per minute. This means extra yardage, more cycles every hour, more output every shift. Crowd and retract cable is self-contained in boom, stays intact when boom is removed. Every time you convert from shovel to another attachment you save reeving time . . . lowers cable costs.

2 PUSH-BUTTON DIPPER TRIP works every time

Every time operator pushes trip button, dipper door opens in less than ½ of a second. Thumb-sized release button is located right on top of swing lever; operator's hand never leaves lever. Works perfectly without adjustment at any boom angle. Entire mechanism enclosed. Dumping the dipper load at just the right second is easy . . . you save seconds every cycle . . . get extra production every shift.

3 INDEPENDENT TRAVEL cuts non-productive time

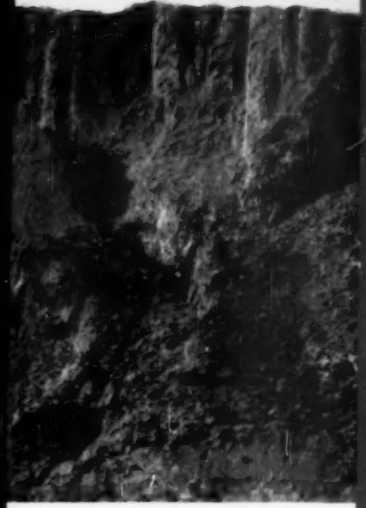
On the Koehring 205, two-speed traction is free, independent of all other operations. A separate lever controls each crawler. You can travel, swing, hoist, raise or lower the boom all at the same time. Whenever you move frequently, or change boom angles to change reach, this quick maneuverability cuts non-productive time . . . steps up production on some jobs as much as 50%. More work every day.

• • • KOEHRING DUMPTORS WILL STEP UP OUTPUT ON YOUR

Also, check with your Koehring Distributor on the Heavy-Duty

KOEHRING COMPANY

4 ways



4 CLUTCHES need no "warm-up" adjustments

No need for operator to take time out, when he starts in morning and after lunch, to loosen cold clutches, then tighten them when they warm up. With the 205, heat-compensator springs on six main clutches automatically keep clutches working smoothly and easily, without manual adjustments. This feature is very important on clamshell work where you tend to have intermittent service.

OFF-ROAD HAULING

304 and 605 Shovels

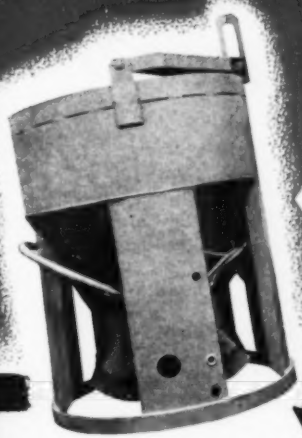
MILWAUKEE 10, WISCONSIN

JOHNSON *job-proved* CONCRETE BUCKETS

Here are a few quick facts on the big Johnson line of easy-handling, heavy-duty concrete buckets . . . each model engineer-approved on today's biggest dam and general construction jobs:

1 TO 4-YD. JOHNSON-DRAVO type buckets are hand-wheel operated . . . have big, single-clam discharge gate. Smooth-welded, sloped interior provides fast flow of stiffest or large-aggregate concrete. 4 sizes.

½ TO 1½-YD. [illegible] FINGER-TIP CONTROL buckets are ideal on general construction, for handling normal-slump concretes of average-size aggregates. Single-lever operated. 3 sizes.



2 TO 8-YD. LO-SLUMP handles any stiffness of concrete . . . has built-in vibrator. Extra large, double-clam discharge can be operated manually or by compressed air. Adjustable rubber seal makes bucket grout-tight. 2, 3, 4 and 8 cu. yd. sizes for [illegible]

SEND FOR COMPLETE FACTS

To: The C.S. JOHNSON Company, Champaign, Ill.

Please send information on your concrete buckets: ☐ JOHNSON-DRAVO ☐ FINGER-TIP CONTROLLED ☐ JOHNSON LO-SLUMP

NAME..... TITLE.....

COMPANY.....

STREET.....

CITY..... STATE.....

KOEHRING PRODUCT

C.S. JOHNSON COMPANY
Champaign, Illinois
KOEHRING SUBSIDIARY

CKB22A

How a roving Diesel power plant pulls away from expense!

Here is an unusual power plant that goes places and does things . . . savings-wise! The truck-mounted Diesel is a husky 8-cylinder, turbo-supercharged Cooper-Bessemer rated 450 hp at 720 rpm, direct-driving an AC generator.

This roving power plant and three others just like it, all Cooper-Bessemer equipped, belong to a progressive oil line company in the southwest. All four are used as *portable standbys* to permit the maintenance and overhaul of stationary main line units. They simply roll up to a station and go to work, supplying power to replace that of one of the regular units while the latter is shut down. Thus there's no need to provide for permanent standby power in each and every station. This extra expense burden is held to a practical minimum.

Whether your power needs call for portable or stationary service, for conventional Diesels, gas engines, or the revolutionary gas-Diesels, there are modern, efficient Cooper-Bessemers from 110 to 1800 hp that will fit your requirements to a "T"! Get in touch with the Cooper-Bessemer office near you for helpful cooperation.

The
Cooper-Bessemer
Corporation

MOUNT VERNON, OHIO — GROVE CITY, PENNA.

New York Washington Tulsa Dallas Seattle
St. Louis Houston Los Angeles Shreveport
Calmes Engineering Company, New Orleans, La.

HAUL MORE LOADS AT LESS COST

Combining rugged construction, large capacity and high speed, Euclids turn payloads into profits on off-the-highway construction and industrial jobs.

Owners prefer Euclids because they are efficient under a wide range of operating conditions, and have proved their ability to haul more loads at less cost. Long life and low maintenance cost result in better profits on mining and construction jobs where "Eucs" set the pace.

Operators prefer Euclids for their excellent maneuverability and ease of handling . . . and because the Euclid form-fitting seat provides comfort on rough hauls. Euclid air booster steer reduces driver effort on turns . . . gives positive control on soft fills and tough haul roads.

Your Euclid Distributor or Representative will be glad to show you how Euclid equipment can do a better job for you.

The EUCLID ROAD MACHINERY Co.
Cleveland 17, Ohio

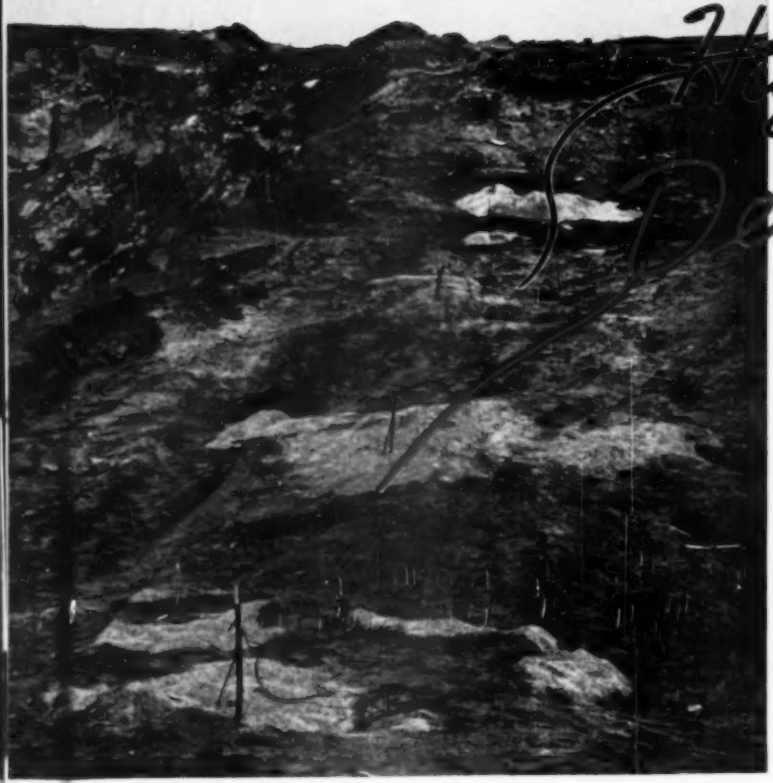
These Bottom-Dump Euclid Features Mean Greater Profits

Low loading height and wide top area for fast, easy loading . . . 13 cu. yds. struck measure . . . payload capacity 40,000 lbs. . . . loaded top speed 26 m.p.h. . . . Diesel engine of 150 to 200 h.p. rating . . . built for off-the-road hauling of earth, ore, sand, gravel and other materials.

EUCLIDS *Move the Earth*

Higher Qua
Delayed

Describing fractional-second spacing of blasts by means of an electric-motor-powered blasting switch. In two years' use at quarries of the New York Trap Rock Corp., a switch developed by the author has fired over two million pounds of explosives with a record of vastly improved fragmentation and reduced vibration.



• Above: Holes are ready for firing here. Primacord and caps are taped to sticks to prevent Primacord from bending, causing a cutoff. Wires lead to delayed action blasting switch.

ry Profits With tion Blasting

By L. F. Miller

Assistant General Superintendent, New York Trap Rock Corp., Newburgh, N.Y.

• The author displays the delayed action blasting switch which he invented. To date, the switch has fired more than two million pounds of explosives without a misfire or failure of any kind.

ABOUT 1895, ammonia dynamite for general blasting purposes was introduced in this country, followed a few years later by ammonia permissibles. Detonation was produced by means of a blasting cap and fuse. A short piece of fuse was placed in the cap and then stuck inside the stick of dynamite used as a primer. The fuse was lighted and the blaster would then run as far as possible before the explosion took place. This was the only method of detonation until several years later when the electric blasting cap was developed.

This cap differed from the original fuse and cap because it could be detonated from a distant point simply by throwing an electric switch. Also, a great number of caps could be detonated at one time. Connections were made either in series, parallel, or some combination. But regardless of the manner in which they were connected, all caps fired at the same time and instantaneously.

Rapidly Put to Use

Quarry operators immediately realized the tremendous possibilities of this new explosive and it was quickly put to use in places where stone was being produced. Mine operators also seized the idea and in a short while, dynamite was the principle blasting agent used in bringing down great piles of material at one time, rather than a very small amount as in previous practice.

Within a very few years after the

• Delayed action shot being fired in photo on opposite page produces the excellent fragmentation shown here. Workmen observe blast from safe distance. Shot is Buckeye Series 40 % Gelatin, 3½" holes drilled

use of dynamite was well established, operators realized that a far greater amount of stone could be blasted down on the quarry floor than could be picked up by hand and loaded on wagons or cars for delivery to the crushers. Steam shovels and drills had been in use for several years, but these had not been designed to handle the greater production now possible.

Manufacturers of this equipment renewed their efforts to produce faster, more powerful shovels, and drilling equipment was given much thought. Drilling was one of the chief factors because holes had to be provided before explosives could be used. The introduction of dynamite brought about a great change in all fields connected with the quarrying industry, including manufacturing of equipment, explosives, and other related materials.

During the years to follow, manufacturers made great improvements in their equipment. Shovels were developed that could handle thousands of tons of materials each day. Air drills replaced the heavy cumbersome steam drills. Methods of transporting the raw material from the pit or quarry to the crushers were greatly improved upon and speeded up.

Speeded Well Drill Development

Well drills were found to be more than a dream and their use made it possible to drill large holes the full depth of high quarry faces and load the holes with dynamite. Instead of blasting down a few hundred tons of material, it was now possible to bring down enough in one blast to keep a plant supplied for a long time.

Neither were the explosives manufacturers standing idly by during this time. They were constantly working in their laboratories and in the field, improving their product in many respects. Explosives were made safer to transport and handle. Efficiency was increased and new types of explosives developed to be used for particular purposes. Better caps were produced, and eventually blasting and explosives became a field of their own.

While all these changes and improvements were taking place, one phase of explosives had been at a standstill. This was the method of actually firing the blast after holes were drilled, loaded and connected.

With practically the same procedure used more than 40 years ago when electric blasting caps were first introduced, the holes were still being hooked up and all fired as one unit, instantaneously. Some experimenting had been done by individuals and companies, but nothing more than test shots were ever fired that would differ from the standard method of firing a blast.

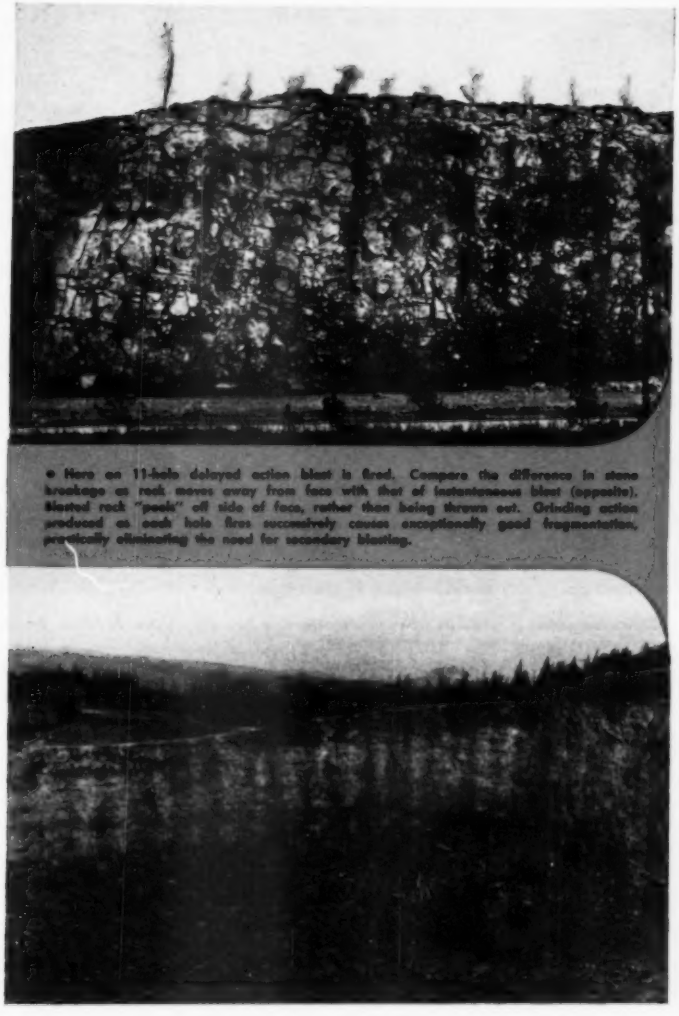
• An instantaneous 8-hole blast is fired in dolomite. This older method throws the stone straight out from the face, usually requires secondary drilling before shovel can move in. Note difference between fragmentation (below) acquired with this 8-hole instantaneous blast and that achieved with delayed action blasting of 22 holes in picture opposite. Photos taken at same place.

Delay Blasting Develops

The practice of firing blasts instantaneously continued without much change until about 1945 when one of the powder companies found that by using a special explosive along with a fast delayed cap, better fragmentation and reduced vibrations could be accomplished in connection with primary blasting. Other companies were trying methods of shooting that would produce a slight delay between the different holes as they fired. It was usually found that with any method of delay used, the results obtained were encouraging.

I had been giving considerable thought along this line for some time and in July, 1946, designed and built what was among the first successful "delayed action blasting switches." This switch was operated by an electric motor which in turn rotated a flat switch blade.

As the blade rotated, contact was made with points around a circle to which cap wires (one leading from



• Here an 11-hole delayed action blast is fired. Compare the difference in stone breakage as rock moves away from face with that of instantaneous blast (opposite). Blasted rock "peels" off side of face, rather than being thrown out. Grinding action produced as each hole fires successively causes exceptionally good fragmentation, practically eliminating the need for secondary blasting.

each hole) were connected. The other cap wire for each hole was connected to a common wire leading to the switch. No electric power could be applied to either wire until the switch was rotating and the firing switch closed. The first switch built had 14 contact points and any number of holes from one to 14 could be fired.

The first blast on which the switch was used was four holes and the results were more encouraging than had been anticipated. From this time on, the number of holes to be fired was increased until it was finally realized that there seemed to be no limit as to the number that might be fired in any particular shot—and with no increase in vibration. In fact, it became evident that the vibration produced when a large number of holes was fired in one blast was slightly less than that produced when a small number (such as three or four) was fired—even though the delayed action switch was used in each instance.

The first switch was built with a delay interval of .020 seconds which seemed to be about the right amount. Since then a large amount of experimenting and testing has been done along this line, and while no definite rule can be given as to the exact time delay that might be used, something about .028 to .032 seconds seems to give the best results for general purposes. Although there are certain stones that might require a much shorter delay, it is very doubtful if a longer period will be helpful in any respect.

The original 14-hole switch soon became obsolete due to the limited number of holes that could be fired. During the following winter, I built a larger switch with provision to fire 31 holes in a single blast. This switch has to date successfully fired over 2,000,000 pounds of explosives and there has never been a failure or misfire of any kind. Neither have we ever had any blasting cap connected to the wires leading to the switch fail to fire.

Find Dual Benefits

Probably the most important developments in connection with delayed action blasting have been improved fragmentation and reduced vibration. When the delayed blasting idea was first conceived, it is very doubtful if anyone anticipated more than a blasting technique which would reduce vibrations or ground movements. Vibrations were proved to be materially reduced after a few small shots were fired. As the number of holes was increased in following blasts, it was found that the vibrations became even less. Improved fragmentation came as a surprising extra dividend.

Although we have not been able to find an ideal number of holes which, if fired in delayed sequence, will indicate an optimum has been reached, it is evident that the benefits increase with the number of holes fired. Similarly, while the time interval between holes does appear to have a definite relation to the vibrations developed when blasting in different grades of stone, no given delay has been found to produce the optimum result. Neither can it be proved by seismograph records that there is any limit to the number of holes that might be fired in one blast.

Typical Quarry Procedure

Let us take a typical quarry blast that might be fired in any of our quarries and follow it through from start to finish. Before any blast is fired, steel pins are driven in the ground behind each hole. These pins are located 50 feet behind the holes and in this manner it is always possible to set the next round exactly the right distance back.

In laying out the following round after the blast is fired (and assuming

• Left: Workers load hole with explosive. The most powerful is placed in bottom charge to insure good breakage and fast movement.

• Above: A 4-yd. Bucyrus-Erie 100-B loads well-blasted rock to International-drawn 10-yd. Easton trailer.

the burden is to be 24 feet) a distance of 26 feet is measured toward the face from the pin which had previously been driven down. This gives us the new line on which the holes will be drilled. The spacing averages about 24 feet and the depth is governed by the height of the face.

Drill Below Quarry Floor

We drill five feet below the quarry floor and this amount will be added to the total depth of the hole as computed by the difference in elevations at the floor and collar of the hole. We will assume this difference to be 120 feet. By adding the five feet below the floor, total depth of the hole will be 125 feet.

After all the holes are laid out and staked, drilling operations are started. While the holes are referred to as 9-in., the actual size is somewhat larger to permit easy loading of the explosives—which measure a full nine inches. In order to lower the powder to the bottom of the hole without difficulty, a bit measuring about 9⅜ inches across the face is used. This size is carried the full depth.

Drilling operations will proceed at the rate of three to five feet per hour depending on the type drill used and the kind of stone being drilled. We will assume that an average of four feet per hour will be maintained. On this basis, about 32 hours will be required for each hole drilled. The number of holes varies for different shots so we will take one hole and compute it individually. If conditions are the same for all holes, the totals for this one hole would be the same for all others. In actual practice this is seldom the case. Usually, each hole must be figured separately.

After all the holes are drilled and checked for depth, the amount of explosive required for each hole is determined. As the burden is 24 feet, the spacing 24 feet and the depth 125 feet, we have a total of 2,667 yards for the hole. The powder ratio used will be .6 pounds per yard which will require 1,600 pounds. The greater part of explosive is loaded in the bottom charge with the most powerful in the very bottom to insure good breakage and fast movement.

Use Bottom and Deck Loads

One or two Primacord lines are connected to the bottom charge and to each successive primer used. After the bottom load is completed, stemming is shoveled in the hole to fill it up to the first deck charge where a lesser amount of explosive is loaded than that used for the bottom charge. The number of deck charges varies but usually there will be three or four in a 125-ft. hole. In most cases, the same explosive is used throughout, except for the extreme lower section of the hole.

Tape Primacord Ends

As the loading of each hole is completed, the Primacord ends are taped, covered with a waterproof paper and buried in the stemming at the top of hole. After all the holes are loaded and the shot is to be fired, these Primacord ends are uncovered and cut off to the proper length with about one foot sticking above the top of hole.

Two caps are taped to the Primacord ends and these caps are connected in parallel with one pair of the lead wires going to the white common wire and the other pair to an orange-colored wire leading to the blasting switch. A wooden stick is then pushed in the hole with about one foot of it left protruding above the ground. The Primacord and caps are taped to this stick to prevent the possibility of a sharp bend forming in the Primacord which might cause a cutoff at that point.

After all connections are made, each hole is tested separately and then connected to the switch after

• Two working 42-T blast hole drills are silhouetted against a dark sky while 5-yd. Bucyrus-Erie 120-B loads rock at foot of highwall.

which each is tested again. All preparations have now been made for blasting. As the shot fires, it is an easy matter to follow the detonation from one hole to another. The action of the stone is entirely different than in an instantaneous blast and instead of the entire mass blowing out all at once, it peels off the face something like a huge door swinging open.

When hole No. 1 fires it starts to move straight out from the face, but immediately following this the next hole fires. Since the stone in front of hole No. 1 had already started to separate from the face, this allows hole No. 2 another outlet.

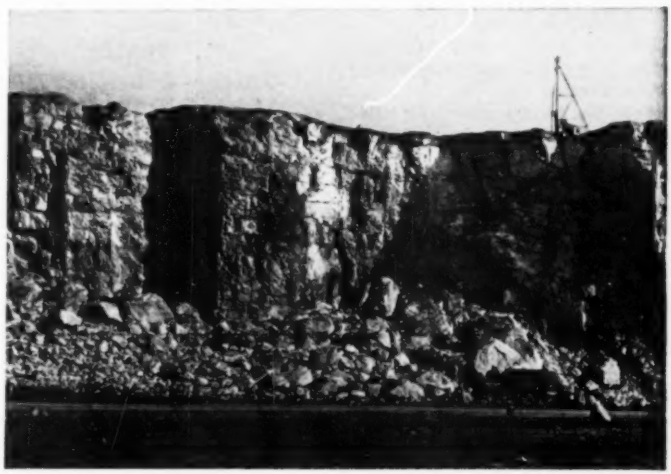
Delay Produces "Grinding Action"

Instead of throwing the stone straight out from the face, a part of it is directed toward the stone already in motion from hole No. 1. This action continues right on down the line as each hole fires. It is this grinding action developed as each successive hole fires that is largely responsible for the wonderful fragmentation achieved by this method of blasting.

After the stone is shot down in the quarry, a bulldozer is usually on hand to shove in the loose stone scattered out from the main pile. But whether this is done or not, the shovel can move right in and start digging as very little secondary drilling is required. Practically all the large stones will be found on the top of the pile where they have fallen from the top of the highwall. Very seldom are stones too large for loading found inside the pile.

Each month during the operating season, three or four blasts are fired in each quarry as compared to 12 to 15 before delayed action blasting was developed. Previously, we had been limited to three or four holes in each blast. After they were fired, it was usually two or three days before the shovels could be moved in because a great number of big stones had to be drilled and shot to reduce the rock to

Continued on page 51



• Results obtained when two separate 3-hole shots were fired. Before delayed action blasting was developed, 12 to 15 blasts a month were necessary to supply the shovels. Today, delayed action blasting does a better job with three or four blasts a month.

An Ev

• As street after street in Phoenix was torn up, signs like these reminded motorists that the temporary inconvenience and dust caused by the pipe laying would end in permanent benefits.

A new filtration plant, booster unit, reservoir and pipelines being constructed at a cost of over $5 million will bring 50 mgd to water-short Phoenix, Ariz., from the Verde River 35 miles away.

By Lon Fanald

BACK in the 1880's, an enterprising saloon keeper went West to seek his fortune in Phoenix, Ariz. Located in the heart of the Salt River Valley, Phoenix was "dry" in more ways than one. The saloon keeper saw his opportunity. He dug a well and installed an overhead tank to supply water, at a price, to surrounding embryo businesses.

From that beginning, a private water company developed which handled water service until 1906, when the City of Phoenix took over the system. Until 1919, the city supplied water from wells within the city limits. Because of salt content the water was highly objectionable for both its hardness and bad taste. Public demand forced the beginning of a modern water system in 1919 when work began on a project to bring water from the Verde River, 35 miles to the east of Phoenix across rolling desert country. By 1922 the job was completed.

Select Verde River

Verde River was selected because its water is unusually attractive for domestic consumption. In the arid Southwest almost all waters are hard and salty, but Verde River water has two outstanding characteristics: Its hardness is about ½ that of the valley water — 200 ppm to 500 ppm, and its chloride content of 25 ppm is less than 1/20 that of other water, which averages about 400 ppm. It is the chloride content which accounts for the objectionable salty taste of well water which originally supplied Phoenix.

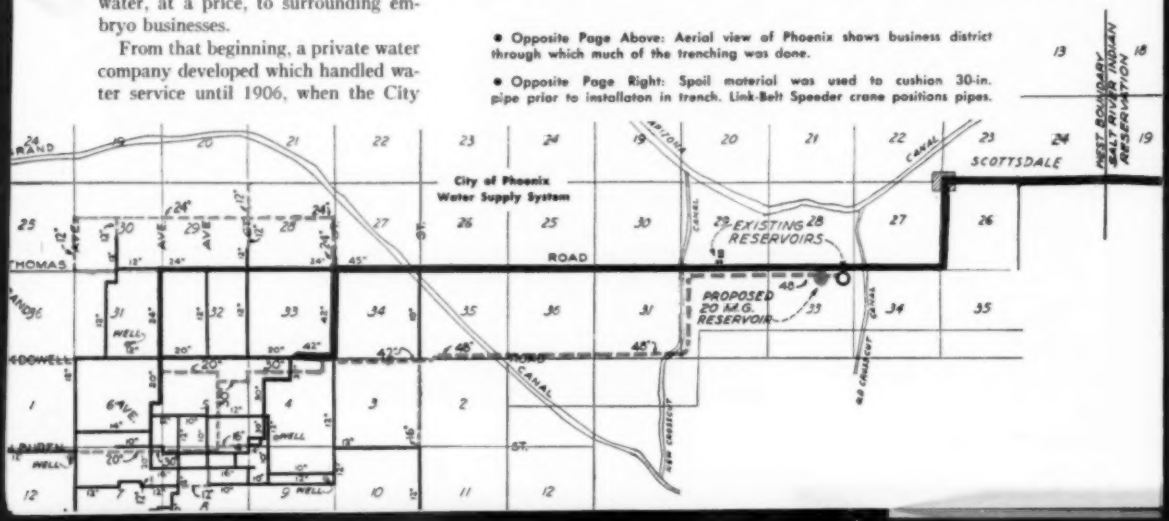
The original pipeline from the Verde was of wood stave construction, the greater part of which was laid above ground. Because of unsatisfactory hydraulic conditions, the line could not be kept full at all times and deterioration began almost immediately. By 1930 the line was of little use and a new 48-in. concrete line was installed.

Water Demand High

Since then, Phoenix has grown from a population of 48,000 to one of over 115,000, the population of the metropolitan area estimated at 250,000. Water consumption demands skyrocketed until 1946 when a peak demand of 44 mgd was reached, which was more than the 48-in. line with its 30 mgd

• Opposite Page Above: Aerial view of Phoenix shows business district through which much of the trenching was done.

• Opposite Page Right: Spoil material was used to cushion 30-in. pipe prior to installaton in trench. Link-Belt Speeder crane positions pipes.

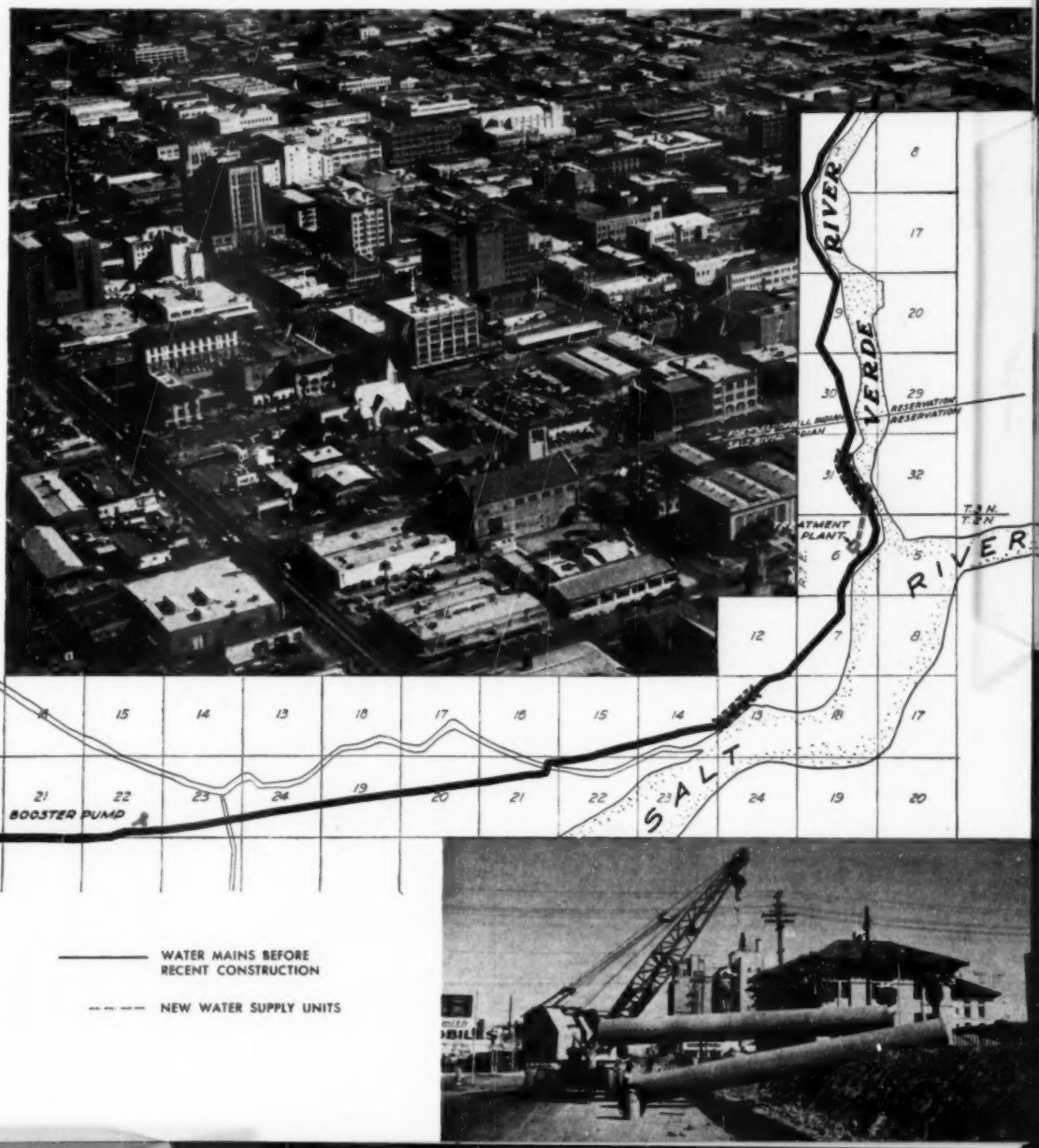


en Flow to Phoenix

capacity could supply. Extra water was obtained from wells within the city, taking Phoenix back to its original salt water problems.

Water demand is greater in Phoenix than in many other parts of the country. All vegetation must be artificially watered because of the low annual rainfall. Lawns and gardens are cultivated throughout the winter. Nearly every home and office building has an "evaporative" air conditioning unit — highly successful in this area because of low humidity. These factors lead to an unusually high water demand, with consumption going to 425 gallons per capita a day during the peak of summer's heat.

By 1946 the deficiencies of the 48-in. line became acute. With the war over, Phoenix citizens refused to put up any



• The trench for the 48-in. pipe is six feet wide and 12 to 14 feet deep. The 30-ton Austin trencher (background) digs in solid caliche here, putting down the trench in one pass at the rate of 40 feet per hour.

• Below, Left: Workmen guide 8-ft. joint of 48-in., 100-ft. head pipe as it goes down into trench.

• Below: Lorain 40 crane slowly lowers 48-in. pipe closer to trench bottom.

longer with the bad well water. They voted a $6 million bond issue, and the construction of new water supply units — a new filtration plant, a booster plant, a new city reservoir and additional pipelines — began in 1947.

New Feeder Main

The existing 48-in. pipeline transmits water from the filtration plant to the city reservoir. A new 48-in. feeder main seven miles long was installed from the reservoir to the city. Contract for this line was let to the Arizona Sand and Rock Co. for $745,002.10. About three miles of line are of centrifically cast concrete pipe with cage reinforcement manufactured by the Arizona Concrete Conduit Co. The balance of the pipeline, which operates under high pressure, is steel shell with centrifugally cast concrete lining and "shotcrete" exterior coating. This portion of the pipe was furnished by the United Concrete Pipe Co. of Los Angeles where it was manufactured before it was hauled to Phoenix on Sterling and Auto-Car diesel trucks.

The pipeline involved 100,000 cu. yds. of excavation. Clearing the way outside the city limits presented no particular problem other than the construction of siphons under two irrigation canals. Because excavation was mostly in caliche, a cemented gravel, no drilling or blasting was necessary.

Trenching Operations

In open country, ditchers were able to open up 900 feet of 72-in. trench to a depth of 10 to 14 feet in one 8-hr. shift. Excavation was slowed down when solid caliche and decomposed

• Down at last, 8-ft. section is connected to another section end. In far background is 30-ton Austin trencher.

granite was hit at the bottom of the trench.

The trenching excavation was handled by a 30-ton Austin trencher, a Parsons trencher, two Lorain 40 truck cranes (which also handled laying of the pipe), a Link-Belt clamshell, and a Bucyrus-Erie 15-B dragshovel.

At the eastern edge of the city, the 48-in. line branches into the city main feeder lines with 42-, 30- and 24-in. feeders leading out through the city and 16- and 12-in. lines feeding from them. Arizona Sand and Rock held the contract for the 42-in. for $121,849 and the 24-in. for $224,821.70; the Fisher Construction Co., the 30-in., for $121,849, and the 16-in. for $247,002.83; and Welsh and son, the 12-in. for $131,281.48.

Move Palm Trees

Within the city limits, pre-excavation preceded trenching by several blocks. Sidewalks and driveways had to be removed and extensions built to allow the ditching machines to move right in. Palm trees, some 48 inches in diameter and over 50 feet high, had to be moved to one side and replanted after the pipe was laid.

Ten miles of paving averaging five feet in width, had to be removed. Inconvenience to Phoenix drivers was kept to a minimum by an unusual use of excavated material. A cut approximately five feet wide was made in the paving and the material broken to a depth of 12 inches before it was hauled away. Dirt from the excavation stations was hauled in immediately to fill the space left by the removed paving. It was then rolled down and sprinkled, permitting cars on the streets until ditching machines moved in. As a result, traffic interruption and interference were held to a bare minimum.

Prime contractors on the job labelled the problems of excavation and laying the pipes within the city limits as "obstruction-plus." At one point in downtown Phoenix, contractors encountered a sanitary sewer, a storm sewer, five different water lines, covered cables for a high voltage power line, two telephone cables, Western Union telegraph service lines, stop and go light circuits, abandoned water and storm drain lines, and a 40-in. irrigation pipe which had to be supported and kept in service. Underground obstructions ahead of trenchers were located by radio M-Scope pipe finders.

Clearance between some obstructions was almost nil. In one place, a 30-in. pipe had to be laid between high voltage power and telephone trunk conduits with ¼-in. clearance. A special roller saddle was constructed to carry the 30-in. pipe and roll it through the 30¼-in. space.

The Lorain truck cranes, a Link-Belt clamshell, Bucyrus-Erie dragshovel and Northwest shovel handled most of

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• **Above, Far Left: James Eager, excavating foreman for Fisher Construction Co., uses radio-operated M-Scope pipe finder to locate underground obstructions.**

• **Above, Center: Traffic interference at busy intersections within city was kept to minimum. Lorain 40 crane, ready to lower major pipe valve into trench. Excavated spoil bank took up only 15% of the corner space here.**

• **Above: John Ryan (right), chief of construction operations for Arizona Sand and Rock Co., talks to Paul Ban in charge of materials for United Concrete Pipe Corp.**

• **A ½-yd. Bucyrus-Erie 15-B dragshovel is unloaded from 21-ton, 8-wheel utility LSTX-12 tilt-bed trailer, drawn by 4-ton GMC tractor. Ditchers, shovels and other heavy equipment were loaded to this trailer to speed up movement of machines from one job to another in city. As a dragshovel, 15-B handled excavating for lateral canals; as a crane, pipe laying.**

Houst
Flood

Totalling 25 miles in length, Barker and Addicks Dams — two of the world's largest earthfills — now protect Texas' largest city from damaging floods.

BAD floods, due to surface runoff from surrounding territory, have long plagued Houston, Tex. But protection is on its way. Located about 18 miles west of Houston, Addicks and Barker Dams, with reservoirs controlling a total drainage area of 279 square miles and draining into a rectified channel, are part of a plan which will effectively prevent a repeat of floods like that of 1935 which

• Above: Four draglines speed up channel excavation. (Left to right) 3-yd. Bucyrus-Erie 54-B, and three Northwests, two 2-yd. 6's and 3-yd. 95, load to Caterpillar DW-10's. Left are two Caterpillar D-8's.

• Left: Worker checks depth of channel excavation from top of 54-B boom.

• Left Below: Allis-Chalmers HD-19 with Gar Wood dozer moves back material excavated by draglines. In foreground is Kohler lighting plant used for night work.

• Dozers smooth out fill being laid down by scrapers on main embankment of Addicks Dam.

took eight lives and destroyed $2½ million in property. All three are part of an extensive flood control program designed by the Galveston District Corp of Engineers to regulate waters of the Buffalo Bayou which flows through Houston and Harris County.

Completion of the earthfill dams gives the Lone Star state two of the world's longest. Like mammoth dikes, Barker Dam, stretches for 13 miles, with a reservoir covering 13,100 acres, while Addicks Dam is 12 miles long, with a reservoir area of 11,600 acres.

Barker Dam

Barker Dam, the first unit of the project completed, was constructed between Feb., 1942, and Feb., 1945, by several contractors, but principally by Macco Construction Co., Burbank, Calif. This 37-ft. high structure required five million cu. yd. of excavation. Borrow excavation was 3,550,000 cu. yd.; inspection trench, 129,000; channel, 822,000; drainage ditch, 735,000, and structure 36,000. Cost was slightly over $4 million.

Completed late last year, Addicks Dam controls a drainage area of 129 square miles. It was constructed under a $2,701,500 contract held by H. B. Zachry Co., San Antonio. Cost of the entire project was $4,954,000. Zachry's work, begun in May, 1946, was completed about two months ahead of schedule. Excavation totalled over six million cu. yd., including borrow excavation amounting to 5,681,000; channel, 528,000; structure, 27,000, and inspection trenches, 900.

Below the dams, construction of the 3½-mile rectified channel which will serve as an outlet for both reservoirs is being accomplished under two contracts held by McGinnes Bros. of Houston, totalling $496,180. Included in the job are 382 acres of clearing, 1,269,878 cu. yd. of unclassified excavation, 441,600 cu. yd. compacted fill for the abandoned natural channel, 34,497 lineal feet of fence and one reinforced 175-ft. highway bridge on piling.

Channel Cutting

Channel cutting was recently completed seven months ahead of schedule by the use of four draglines. Maximum channel depth is 35 feet with width

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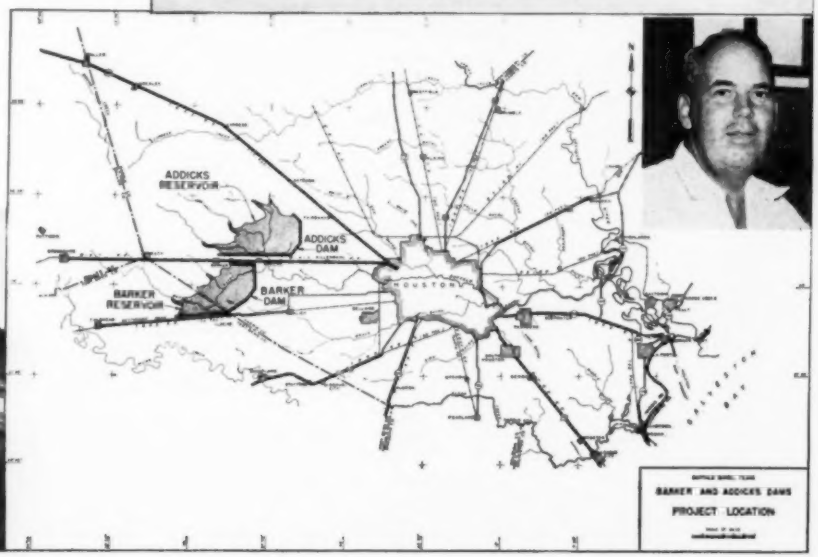
• Right: Artist's conception of Addicks Dam, recently completed. Twelve miles long, it has an 11,600-acre reservoir.

• Inset: Norman W. Brown is resident engineer for both reservoirs.



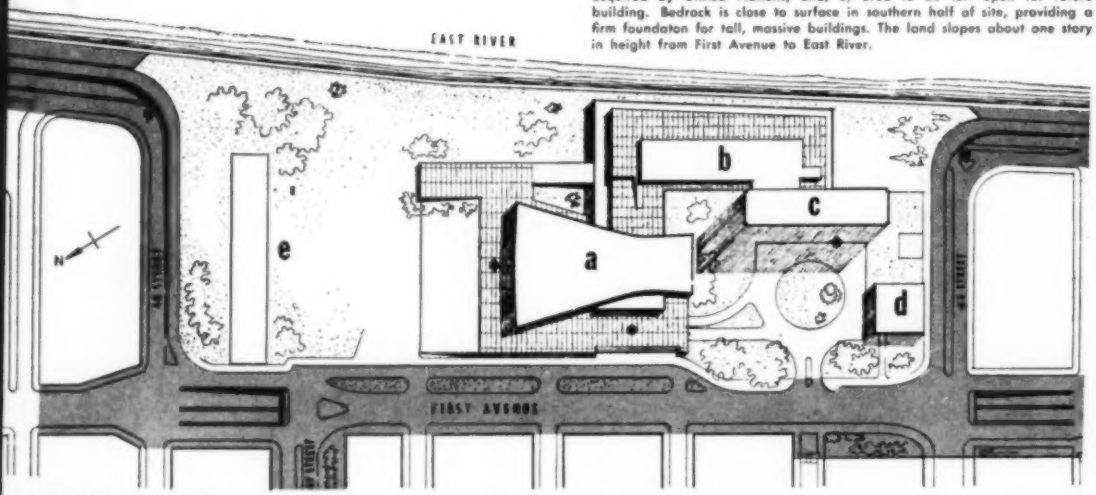
• Map shows project location of Addicks and Barker Dams whose reservoirs, totaling 24,700 acres, will keep floods caused by surface runoffs from endangering homes and businesses in the Houston area.

UN

• Excavators and blasting crews work against a backdrop of New York skyscrapers at UN permanent headquarters site. To right are Roosevelt Drive, East River and Queensboro Bridge.

The United Nations permanent headquarters site in New York presents a scene of noisy activity as work progresses on $65 million project.

• Main sections are located on plan outline: a) General Assembly; b) Conference Area; c) Secretariat; d) Library, built by City of New York and acquired by United Nations, and, e) area to be left open for future building. Bedrock is close to surface in southern half of site, providing a firm foundaton for tall, massive buildings. The land slopes about one story in height from First Avenue to East River.



Headquarters In the Making

EXCAVATING equipment is working at top speed on the East River site in New York City, chosen Dec. 14, 1946, by the United Nations as permanent headquarters. At that time, the General Assembly accepted the offer of the site from John D. Rockefeller, Jr., and the City of New York.

Total estimated cost for the completed project is set at $65 million. The City of New York has contributed an additional $23,485,000 (estimated), including temporary headquarters for the General Assembly at Flushing Meadows, a grant of certain land within and adjacent to the site together with water front rights and easements, and improvements on adjoining land.

These improvements are the construction of a tunnel under First Avenue along the length of the site to divert heavy traffic from direct contact with the site; relocation of East River Drive, including construction of overhead ramps; widening of 47th Street into a boulevard of approach; and widening and landscaping surrounding streets at a series of points as necessitated by tunnel entrances and ramps.

Site Layout

The site itself is 1,500 feet or six blocks long, extending from 42nd Street north to 48th. On the west

• Above: Workers push longer steel into hole being put down by Gardner-Denver wagon drill.

• Below: Looking north, site is intersected at three levels by 44th, 45th and 46th Streets. Shovels at work are 2½-yd. Northwest 80-D (foreground), 2-yd. Lorain 802 (background, left) and 1½-yd. Bucyrus-Erie 38-B.—W. H. Freligh photos.

• Above Left: A drilling squad, using handheld Gardner-Denver paving breakers, unearths a huge oil tank that was beneath cellar floor.—Freligh Photo.

• Right: Clean sand and gravel from excavations is stockpiled at north corner of site to be used for grading. A Caterpillar dozer pushes each dumped load over edge.—Freligh Photo.

• Left: Like a giant pendulum, a skull cracker on Koehring 30-H truck crane bests against 100-ft. cellar wall, pulverizing it thoroughly in one hour.—Freligh Photo.

• Below: Broken concrete and brick: are moved by 1½-yd. Bucyrus-Erie 38-B shovel.

it is bounded by First Avenue; on the east, by East River. Average width is 550 feet—about two blocks.

Demolition of standing structures began in July, 1947. By last September, the job was completed and excavation of the 17-acre site—estimated at 260,000 cu. yd.—was begun by Slattery Contracting Co. The contract calls for completion by the middle of March at a cost of approximately $500,000.

The project consists principally of three elements: Secretariat, General Assembly and Conference Area. Last December the UN Secretary-General Trygve Lie notified four construction firms in the New York area—George A. Fuller Co., Turner Construction Co., Walsh Construction Co., and Slattery —that their combined bid for erection of the Secretariat and complete foundations for the entire headquarters had been accepted.

A skyscraper of 39 stories, the Secretariat will provide office accommodations for 4,000 (3,000 Secretariat staff members at present). Special air conditioning will allow members from Africa to Iceland to control temperatures in their individual offices to suit their climatic tastes. Barring unforseen difficulties the Secretariat will be ready for occupancy by Sept., 1950.

General Assembly Hall

Located in the heart of the project, the General Assembly hall will consist mainly of a large auditorium for plenary sessions with seating capacity for at least 70 member nations (58 at present) and 1,320 spectators. The Conference Area will be a long, low structure housing the three council chambers—Security, Economic, and Trusteeship—conference rooms and numerous committee rooms. The Headquarters Planning staff made up of over 70 architects, designers and draftsmen are drawing up final plans for these two units.

A library, an 8-story structure built by the City of New York in 1947 and acquired by the United Nations, is located on 42nd Street. It has room for 325,000 books. The northern part of the site has been left open so that additional buildings can be erected as needed.

The building for the national delegations and specialized agencies will eventually be located at this extreme northern end of the site. The space requirements for this structure are not precisely determined, but the combined personnel of the two groups is expected in time to equal that of the Secretariat. Its cost is not included in the $65 million estimate. Until the building is erected, meeting facilities and office space will be made available to these groups in the Secretariat building.

To provide the latest in acoustics

Continued on page 48

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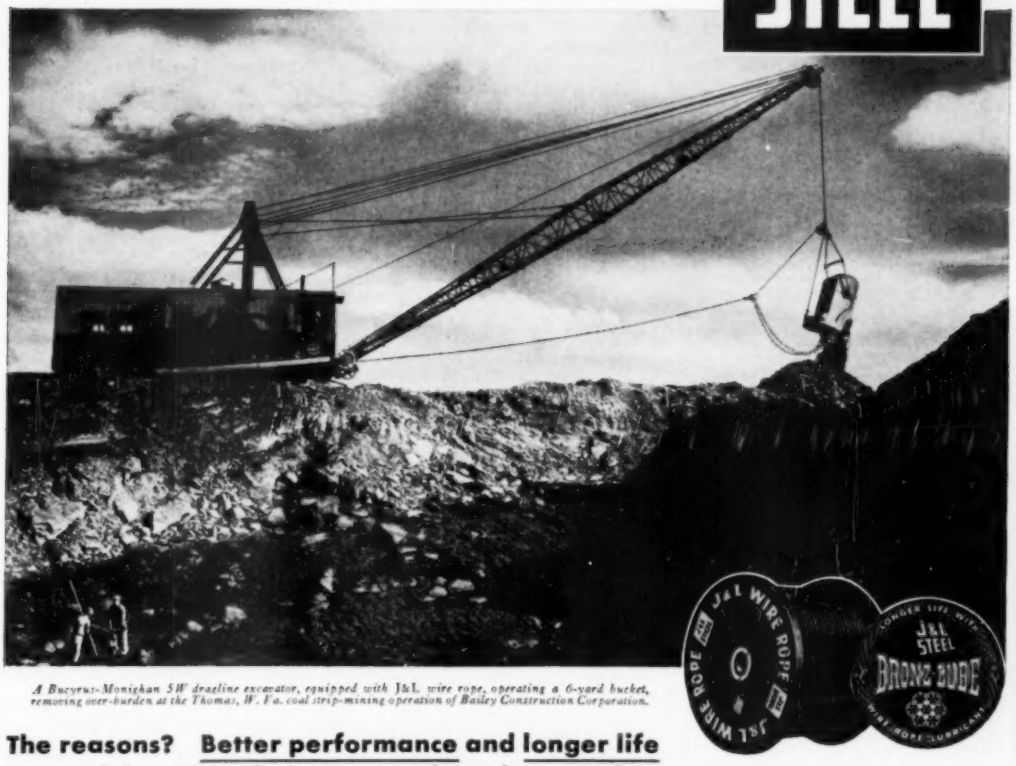
J&L STEEL



A Bucyrus-Monighan 5W dragline excavator, equipped with J&L wire rope, operating a 6-yard bucket, removing over-burden at the Thomas, W. Va. coal strip-mining operation of Bailey Construction Corporation.

The reasons? Better performance and longer life assured by J&L wire rope engineering service.

Bailey Construction Corporation, organized by Mr. Harold L. Bailey, noted coal mining engineer of Schuylkill Haven, Pa., has two coal strip-mining operations under way in West Virginia. One near Thomas, in Tucker County, has four working pits now in operation. The other, soon to be in full production, is at Lorado in Logan County.

On every piece of Bailey's modern equipment . . . draglines, shovels, bulldozers . . . you'll find J&L *Precisionbilt* Wire Rope in a variety of sizes and types, each designed to do a particular job.

One of the basic principles of all Bailey operations is this: *Use only the very best of equipment—and use it properly.*

That's why Bailey has standardized on J&L *Precisionbilt* Wire Rope. Says Mr. Bailey: "Our experience has proved that the combination of J&L Wire Rope and J&L engineering service gives us better performance, longer rope life and lower over-all costs."

There's a growing list of top flight companies engaged in earth-moving, oil production, lumbering, general manufacturing and transportation, that use J&L Wire Rope *exclusively!* Like the Bailey Construction Corporation, they find that J&L *Wire Rope* and J&L *Engineering Service* work together to cut costs and increase profits.

If you are interested in getting the complete details on J&L *Wire Rope Engineering Service* and what it can do for you, why not clip the coupon?

Jones & Laughlin Steel Corporation
429 Jones & Laughlin Building
Pittsburgh 19, Pa.

Please send us a free copy of your new booklet, "J&L Wire Rope Engineering Service."

Name_____

Company Name_____

Address_____

JONES & LAUGHLIN STEEL CORPORATION

From its own raw materials, J&L manufactures a full line of carbon steel products, as well as certain products in OTISCOLOY *and* JALLOY (*hi-tensile steels*).

PRINCIPAL PRODUCTS: HOT ROLLED AND COLD FINISHED BARS AND SHAPES • STRUCTURAL SHAPES • HOT AND COLD ROLLED STRIP AND SHEETS • TUBULAR, WIRE AND TIN MILL PRODUCTS • "PRECISIONBILT" WIRE ROPE • COAL CHEMICALS

Equipment You Ought to Know About

Triple Roll Crusher Plant

Manufacturer: Pioneer Engineering Works, Inc., 1515 Central Ave., Minneapolis 13, Minn.

Claims: A secondary crusher, 4309, which consists of a triple roll crusher with feed hopper and delivery conveyor mounted on a chassis equipped with eight pneumatic tires has been added to a line of portable crushing plants. The 4309 has three rolls to give a double pass of the material, thereby increasing the stage of reduction obtainable from a single unit, according to its maker. The crusher is a size 40 x 22.

The delivery conveyor is 30 inches wide, 20 feet long, and delivers the crushed material into trucks over the front end of the plant. Overall length is 30 ft. 9 in. Brakes can be furnished with mechanical vacuum, or air control. The front bolster is removable, allowing for semi-trailer hitch.

Small Earthmoving Unit

Manufacturer: R. G. LeTourneau, Inc., Peoria, Ill.

Claims: The Model D Roadster Tournapull, a new, small sized unit for earthmoving on small yardage projects is designed for self-loading and one-man operation. Powered by 100-hp diesel or gas engine, the Tournapull which travels at speeds up to 25 mph

is used with the E-9 Carryall scraper, a 9-ton or 7-cu. yd. heaped capacity unit, and is said to be able to turn in a 19-in. radius.

A feature of this new Tournapull is control of all steering and scraper operations by individual electric motors. Operator steers and handles all scraper controls by means of toggle switches located on the Tournapull control panel, thus eliminating the need for a power control unit according to the manufacturer.

Multiple disc air brakes on four wheels, provide 3,132 square inches of braking surface. Mounted on 14 x 32 tapered bead tires it is said this machine is provided with ample flotation in soft material and can travel on paved surfaces without damage. The wheels have been set inside the cutting edge of the scraper blade to enable the rig to do close work along banks or in ditches, according to the maker.

Earth Boring Machine

Manufacturer: California Welding and Blacksmith Shop, Inc., 7222 East Slauson Ave., Los Angeles 22, Calif.

Claims: A new earth boring machine which drills 10- to 72-in. holes, 200 feet deep, is built as a unit that can be mounted on truck chassis 1½ tons or larger. The machine is recommended by its maker for sewage disposal, water well and calyx drilling, soil testing, pier holes, belled footings and oilfield work.

Its 32-ft. collapsible derrick has 20-ton capacity in drilling position. The bucket is fabricated from ⅜-in. rolled plate with a bottom of 1040 cast steel, ⅝ inches thick. Bucket unloading is accomplished by hand tripping arrangement.

Liquid Gear Shield

Manufacturer: Pennsylvania Refining Co., 2686 Lisbon Rd., Cleveland 4, Ohio.

Claims: A new liquid gear shield being marketed under the trade name of Penn Drake Gearteck is claimed to properly lubricate exposed, open and partially enclosed gears and that it is also a perfect lubricant for ways, slides, wire ropes, cables and dipper sticks, as well as the swing-circular rack teeth and dipper handle racks of excavation and industrial machinery, hoists, earth-moving and construction equipment.

Being liquid, Gearteck can be applied with a brush or swab, or may be poured from container directly on the gears. Heating prior to application is not required. Gearteck promptly sets to an almost dry film, according to the maker, thus minimizing attraction of grit, dust and dirt. It is extremely adhesive and will not throw-off the gears even at high speeds.

Other reported characteristics are its stability in both high and low temperatures. It is said not to solidify or to become brittle at temperatures below zero; body and lubricity are maintained under extreme heat conditions.

Trenching Machine

Manufacturer: Everett Manufacturing Co., Inc., Phoenix, Ariz.

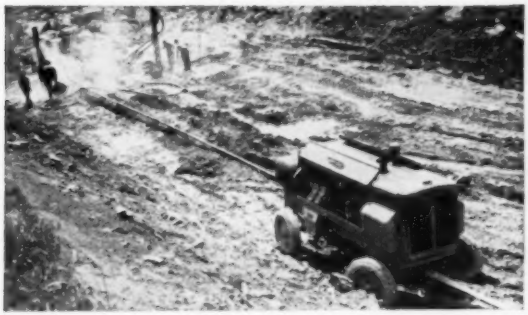
Claims: This new trenching machine will equal the pick and shovel work of 25 men and is made for digging housing project foundations, irrigation lines,

water, gas, electric and sewer lines, farm irrigation and kindred work, according to the manufacturer. It cuts

Continued on page 34

Wouldn't YOU look happy,

doing 4 days' drilling in 3?



On an excavation contract for 1,600,000 yards of approximately 60% limestone and sandstone rock, on U. S. Route 22 east of Pittsburgh, Ralph Myers Construction Co. replaced a good 500 ft. compressor with a "new standard" Jaeger 600 and immediately increased daily footage 35% to 40% with the same two wagon drills.

"I'm doing as much drilling in 3 days as I used to do in 4," says Ralph Myers, who now owns two Jaeger 600's.

Why? Because tools need more air today than they did back in 1932, when the old 60 to 500 ft. compressor ratings were established. 500 ft. of air maintains only 70 lbs. pressure behind two big wagon drills; with 600 ft. you step up pressure to a steady 90 lbs. at which drills will average as much as 40% more footage per hour.

You can get a comparable increase in production with any "new standard" Jaeger Air Plus. From the Model 75, that holds 90 lbs. pressure in a heavy pavement breaker, on up, every Air Plus rating is matched to the tools it is designed for. Ask any Jaeger user. Or go to your distributor who sells and rents "Air Plus" compressors and let him prove it on your job.

75 - 125 - 185 - 250 - 365 - 600 cfm at 100 lbs.

Why you can't match Jaeger ratings with any other compressor:

Jaegers, alone, have been designed with the much bigger valves, port areas, intercoolers, air receivers and clutches, the balanced 2-stage compression and advanced force feed lubrication needed to convert the greater horsepower of today's engines into more air power, at efficient, economical engine speeds. They had to be run at 20% to 30% slower piston speed than others (800 fpm) to hold them down to old ratings until modern engines became available in diesel to match gas.

NOTE: Because of "Fuel Miser" speed control, Jaegers use no more fuel than others when not delivering more air.

THE JAEGER MACHINE CO., Columbus 16, Ohio

JAEGER

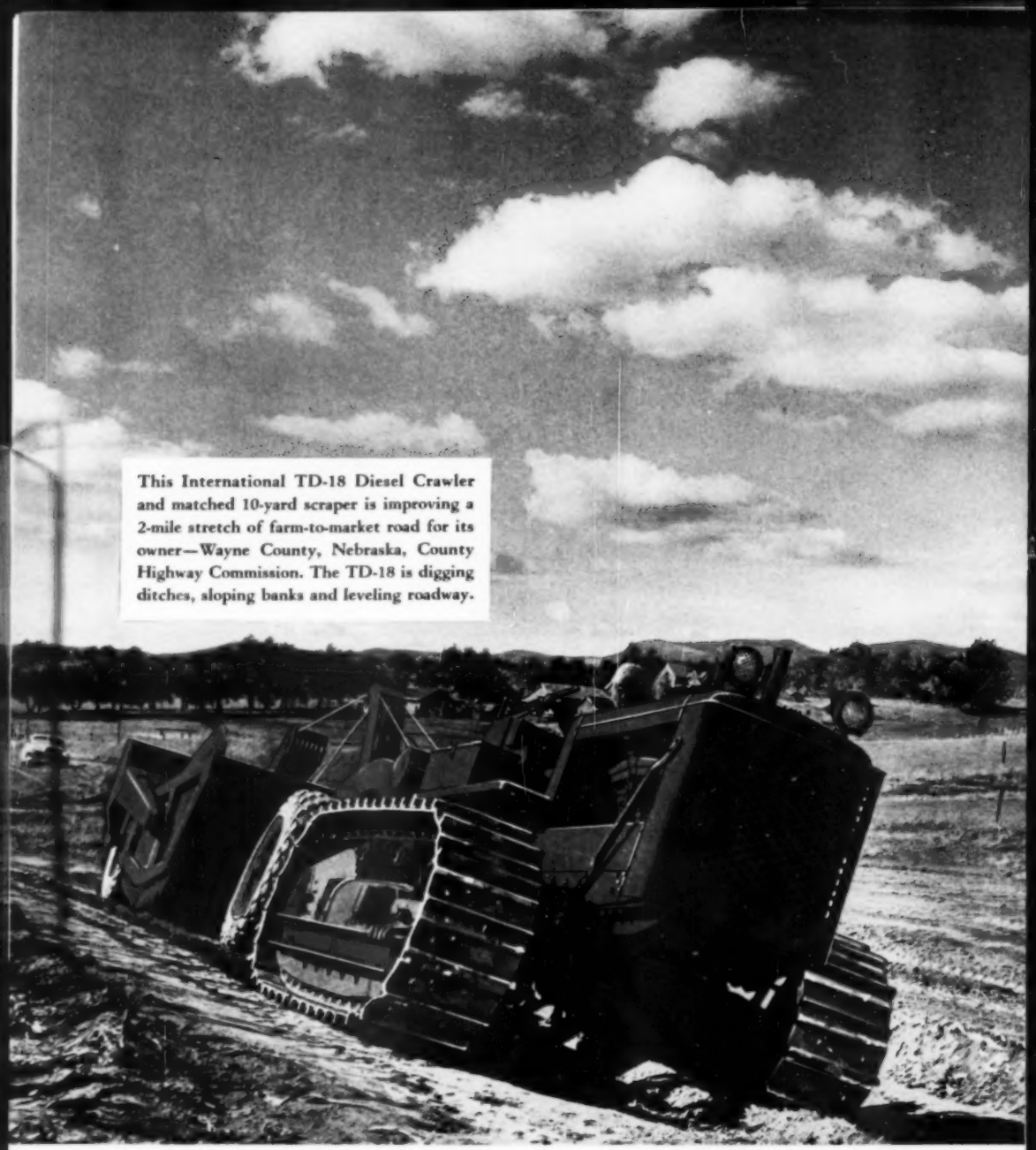
engineered equipment

COMPRESSORS • DIAGONAL SCREED FINISHERS
SCREW SPREADERS • BITUMINOUS PAVERS

PUMPS

MIXERS

HOISTS



This International TD-18 Diesel Crawler and matched 10-yard scraper is improving a 2-mile stretch of farm-to-market road for its owner—Wayne County, Nebraska, County Highway Commission. The TD-18 is digging ditches, sloping banks and leveling roadway.

CRAWLER TRACTORS
POWER UNITS
DIESEL ENGINES
WHEEL TRACTORS

INTERNATIONAL

CO$T-CON$CIOU$ COUNTY COMMISSIONERS *Choose* INTERNATIONALS

Stretching county road construction and maintenance money to do the job takes a bit of doing. That's why cost-conscious county highway commissioners select International tractors and International-powered road machines. International's power-packed performance for every penny of fuel consumed pays off in work done. That means more earth moved and more miles of road built for every dollar invested.

International tractors and engines are built to stand up under the roughest going—to give you more for your money. Contractors and county boards alike, are finding Internationals pay for themselves in a hurry and then continue to pay dividends for a long time to come.

It's good to know your International Industrial Power Distributor is always on hand to help you select International equipment for your needs and to service your equipment, keeping it in top-notch operating order.

INTERNATIONAL HARVESTER COMPANY
Chicago

Listen to James Melton on "Harvest of Stars" every Wednesday evening—CBS

INTERNATIONAL HARVESTER

Industrial Power

New Equipment

Continued from page 30

trenches 12 to 18 inches in width in soils of all types with cast steel digging buckets. It is said it can dig an additional width trench by extending the wheel width of the Ferguson tractor. It cuts down to 42 inches deep, travels from 1½ to five feet a minute, depending upon the depth and width of cut and type of soil.

Other features claimed for the new trencher include special transmission for necessary speed reduction, which can be switched to standard tractor speeds by a shifting lever and easy maneuverability over curbs and up inclines into working position. It can be moved from job to job under the tractor's own power or be transported by trailer.

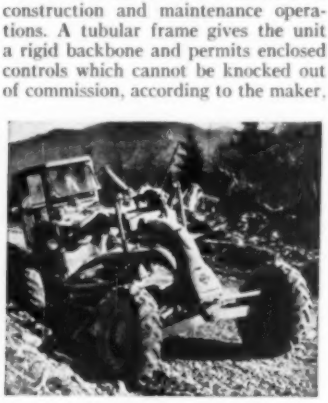
Mounted on a Ferguson tractor driven from the power take-off, the trencher is raised and lowered by the tractor's hydraulic system.

New Motor Grader

Manufacturer: Allis-Chalmers Manufacturing Co., Milwaukee, Wis.

Claims: The new BD-3 motor grader weighing 19,042 pounds is powered by a 78-brake hp General Motors 2-cycle diesel engine. It is claimed that this instant starting 3-cylinder engine provides the power to move capacity loads at increased speeds.

It is said the BD-3 can tackle both construction and maintenance operations. A tubular frame gives the unit a rigid backbone and permits enclosed controls which cannot be knocked out of commission, according to the maker,



who also claims that mechanically controlled front mounted lift cases provide direct down pressure which, in turn, maintains rigid blade settings measured to a fraction of an inch.

Another feature is a 28-in. throat clearance which is said to enable the BD-3 to handle bigger windrows. The blade has a 360° swing which allows the operator to grade either forward or reverse while a short turning radius makes the BD-3 able to work on narrow roads and streets.

It is also claimed the operator platform is built for improved visibility, fewer grease points facilitate fast efficient service care, and a mechanical system of circle control enables the operator to obtain exact settings. Controls and gear shifting arrangement give six speeds forward ranging from 2.21 to 15.58 mph and three reverse speeds ranging from 2.64 to 5.74 mph.

Heavy-Duty Truck

Manufacturer: Four-Wheel Drive Auto Co., Clintonville, Wis.

Claims: The YU, a standard model before the war, has been redesigned and returned to the line of FWD trucks.

Rated at 28,000 pounds gross vehicle weight, the new YU with an all-steel cab, is equipped with a 5-yd. dump body. It is said that it can haul machinery such as tractors and bulldozers in its body. Equipped with a heavy duty trailer it will also pull heavy equipment. The front skirting and bumper can be removed, permitting mounting of snow plows. It can also be equipped with an International earth boring machine, or as a pole and equipment hauler.

The YU features a 142 hp motor, 5-speed transmission with helical gears in all forward speeds, and spiral-bevel ring gears and pinions in both front and rear axles. "Catwalks" are provided on the top of each fender and on top of the front skirting for servicemen to stand on. Of diamond plate construction, these service platforms, together with steps on fender and bumper, permit the servicemen to work on the motor without damage to the finish of the truck.

Oil Testing Kit

Manufacturer: Gerin Corp., Red Bank, N. J.

Claims: A new equipment kit to measure the condition of lubricating oil has been added to a line of oil testing sets. It is said that this outfit can test four samples of oil in 25 minutes.

The equipment kit, which is portable, measures the four dangerous classes of contaminants: 1) change in viscosity due to fuel dilution or other causes; 2) amount of the asphaltic and other oil breakdown substances considered responsible for deposits; 3) amount of dirt, metal particles, other solids and water, and 4) acidity, showing whether corrosion is possible.

Auxiliary Hoist for Concrete Plant

Manufacturer: Erie Steel Construction Co., Erie, Pa.

Claims: Added to the Erie portable concrete plant is an auxiliary hoist hydraulically operated by plant operator. It raises and lowers a concrete bucket

which takes a complete batch of concrete from the plant, thus permitting the next batch to be cycled with little delay, according to manufacturer's claims.

It is said that another advantage is the ability of the hoist to raise each batch of concrete to any desired height. Claims also say that swivel chute operating through a 180° arc adds flexibility to the discharge point.

Hard-facing Rods

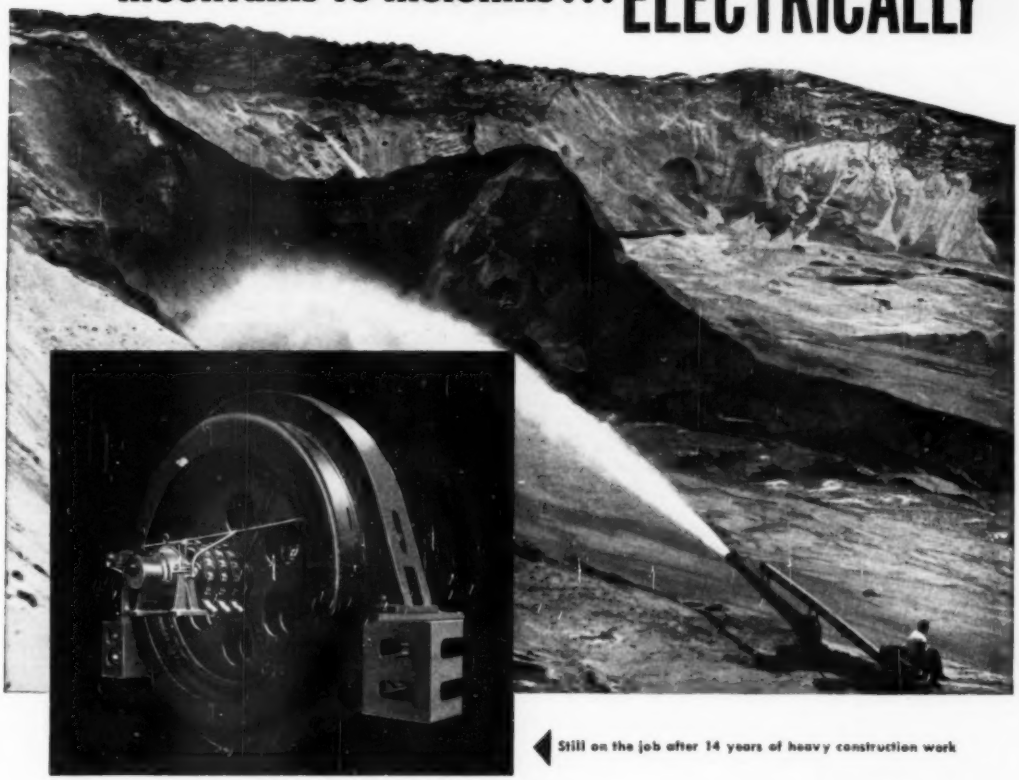
Manufacturer: Haynes Stellite Co., Kokomo, Ind.

Claims: Two new iron-base hard-facing rods, Haynes 90 and 92 alloys, have recently been developed. Haynes 90 rod is highly resistant to conditions of impact, abrasion, and heat, as well as to oxidation at temperatures up to 1000°F. The manufacturer claims that Haynes 90 rod will increase as much as six times the life of the hard-facing wearing parts it protects on earth-moving machinery and equipment used for crushing and handling hard, friable material such as sand, slag, coke, limestone, and coal. Parts successfully hard-faced with this alloy include shredding machine parts, clam shell buckets, lifting hooks, chain links, cement guns, clay mixers, pug mills, crusher rolls and pump plungers.

Haynes 92 rod is a moderately low melting point (2180°F.) hard-facing material claimed to be resistant to the most severe abrasion. It is suitable for applications where a low temperature deposition is necessary to prevent distortion of the base metal. It is not

Continued on page 56

mountains to molehills . . . ELECTRICALLY



Still on the job after 14 years of heavy construction work

Veteran G-E Motors Drive the Pumps on this Hydraulic Sluicing Operation

One 14,000,000-yard sand dune will be dissolved by water from this nozzle to make way for the construction of Los Angeles' new high-rate activated sludge plant. This unique hydraulic sluicing operation depends for its pumping power on six giant General Electric induction motors built back in 1934 for construction of Fort Peck Dam. After serving successfully on that project, they have been reconnected for a different voltage to go back on the job 24 hours a day, six days a week.

Electric drive, which offers the maximum in reliability with minimum maintenance, helps contractors build more for less . . . faster. Whether you buy or build construction tools, ask your General Electric representative to tell you about the inherent advantages of electric drive. *Apparatus Dept., General Electric Co., Schenectady, N. Y.*

ELECTRIFIED CONSTRUCTION
BETTER PRODUCT
LOWER COST

GENERAL ELECTRIC

News from the Field

States Spend One Billion For Roads in 1948

Reviewing highway construction for 1948, U. S. Public Roads Commissioner Thomas H. MacDonald reports contracts awarded by state agencies for all classes of road work in the 12-month period reached an estimated total of $1,150,000,000 not including costs of right-of-way, engineering services and contingencies. The contracts called for improvement on approximately 40,000 miles of primary and secondary roads and urban thoroughfares.

Latest available reports from state highway departments show that Federal Aid and non-Federal projects costing $1,056,442,000 were placed under contract between Jan. 1 and Dec. 1, and involved work on 37,422 miles of road, as compared with a total construction cost of $832,033,000 for improvements on 42,422 miles of road during the same period in 1947.

Road-Building Costs Increase

Commissioner MacDonald said that the increase in total cost with a decrease in mileage of improvements reflects two important factors in highway development—steadily increasing construction costs for all types of road work and a greatly accelerated program of urban improvements involving contract prices ranging up to millions of dollars.

Practically all of the big jobs placed under contract in 1948 were on sections of the new national interstate highway system which comprises the most heavily traveled routes in the Federal Aid primary system, including extensions of the system through metropolitan areas. Approximately 1,490 miles of highways in the system have been improved to modern standards during the past three years at a total cost of $161,166,000. Federal contribution was $85,357,000. On Dec. 1, improvements on an additional 655 miles were under construction at a cost of about $207 million.

Federal Contracts—$746 Million

Contract awards for Federal and Federal Aid projects, including primary and secondary roads and urban extensions in the Federal Aid system, amounted to about $746 million. Of this sum, approximately $15 million was for Federal improvements on roads in national park and forest areas.

The estimated total of motor vehicle registrations during 1948 exceeded 41 million, topping all previous records. Total volume of travel during the year was estimated at 395 billion miles as compared with a total of 370 billion miles in 1947.

Va. Road Expenses Total $48 Million in 1948

Virginia conducted a $48,750,000 road construction and maintenance program during 1948, according to preliminary figures recently released by the State Highway Department. Construction expenditures on the primary and secondary highway systems amounted to $32 million while maintenance expenditures totalled $16,750,000. During the year 123 contracts were awarded, calling for 212 miles of new roads and 53 bridges.

New construction on the primary highway system saw the completion of 218 miles including 39 miles of 4-lane highway and 67 new bridges. On the secondary system of farm-to-market and connecting routes, 500 miles were hard-surfaced and 200 new bridges were built. Bituminous retreatments were applied to 1,400 miles and some 1,600 miles were surfaced with crushed stone and gravel.

Virginia is one of four states in which all secondary highways are administered by the state. There are 38,500 miles in Virginia's secondary system, 9,000 in its primary.

Three Nations Sign Screw-Thread Pact

Representatives of the United States, Great Britain and Canada met in Washington at the National Bureau of Standards recently to sign an agreement unifying standards for screw threads and other threaded components used throughout industry.

The agreement provides that nuts, bolts, screws and other threaded machine parts made in the three countries will henceforth have a 60-degree thread pitch, as used in the American Sellers standard adopted in 1864. This represents a departure by the British from their 55-degree Whitworth thread angle which has been standard in the United Kingdom since 1845. The standardized screws will have a rounded root, as in the previous British standard, while the crests of screws may be either rounded or flat. The compromise makes nuts, bolts and screws of the three countries interchangeable.

Authorities of the American Standards Association, Society of Automotive Engineers and American Society of Mechanical Engineers with British and Canadian representatives have been negotiating for such an agreement since the end of World War I. Efforts to reach an agreement were abandoned in the 1920's.

In 1943, William L. Batt, president of SKF Industries, Inc., and chairman

Continued on page 40

• Part of the road construction completed in Virginia during 1948 is this section of U. S. 60 between Richmond and Williamsburg. Linking Hampton Roads and the state capital, some 20 miles of this 4-lane divided highway have been finished since the end of the war.

A GREAT NEW TIRE THAT GOES IN OFF-THE-ROAD • GETS THE LOAD • AND CARRIES IT OVER THE HIGHWAY

Here, without question, is the greatest tire ever made for trucks that work most of the time on the highway and some of the time on unimproved, rough surfaces.

A massive tire to carry heaviest loads. 50% more tread rubber; tremendous, tough shoulders, practically snag proof. With free rolling ribs for highway travel and tractor-traction cleats for soft going.

THE GENERAL TIRE & RUBBER COMPANY • Akron, Ohio

McLean-Astleford Company

KEEPS MINNESOTA SAND JOB AHEAD OF SCHEDULE WITH...

Hauling conditions varied from one extreme to the other . . . from deep, loose sand to concrete roads. Tournapulls' big, low-pressure tires gave plenty of traction and flotation in sand . . . let them cross pavement without need for planking.

Moves 75% of Total Yardage in First 8 Days of Operation

When McLean-Astleford Company took the contract to grade a new addition to Ft. Snelling National Cemetery, at Minneapolis, they had 45 days to move 40,000 cu. yds. of sand topsoil. They brought in 3 new electric-control "C" Tournapulls to put the job on a high-production schedule . . . moved 75% of total yardage in first 8 days of operation.

Average 2800′ Cycles Every 4½ Minutes

The Tournapulls were loading in deep, loose sand . . . got 10 to 11 pay yards in one minute . . . hauled these big loads 1400′ one way to the fill . . . completed the total 2800′ round trip cycle every 4½ minutes. Instant speed selection provided fast get-away for high average hauling speeds. Power-proportioning differential and big, 21.00 x 25 ground-gripping tires gave plenty of traction in the loose sand . . . also enabled Tournapulls to cross and re-cross the paved roads without surface damage.

Send for Complete Facts

To: R. G. LeTOURNEAU, Inc., PEORIA, ILL. Please send information on "C" TOURNAPULL:

☐ Specifications ☐ Price ☐ Delivery ☐ Would like job analysis on present operations

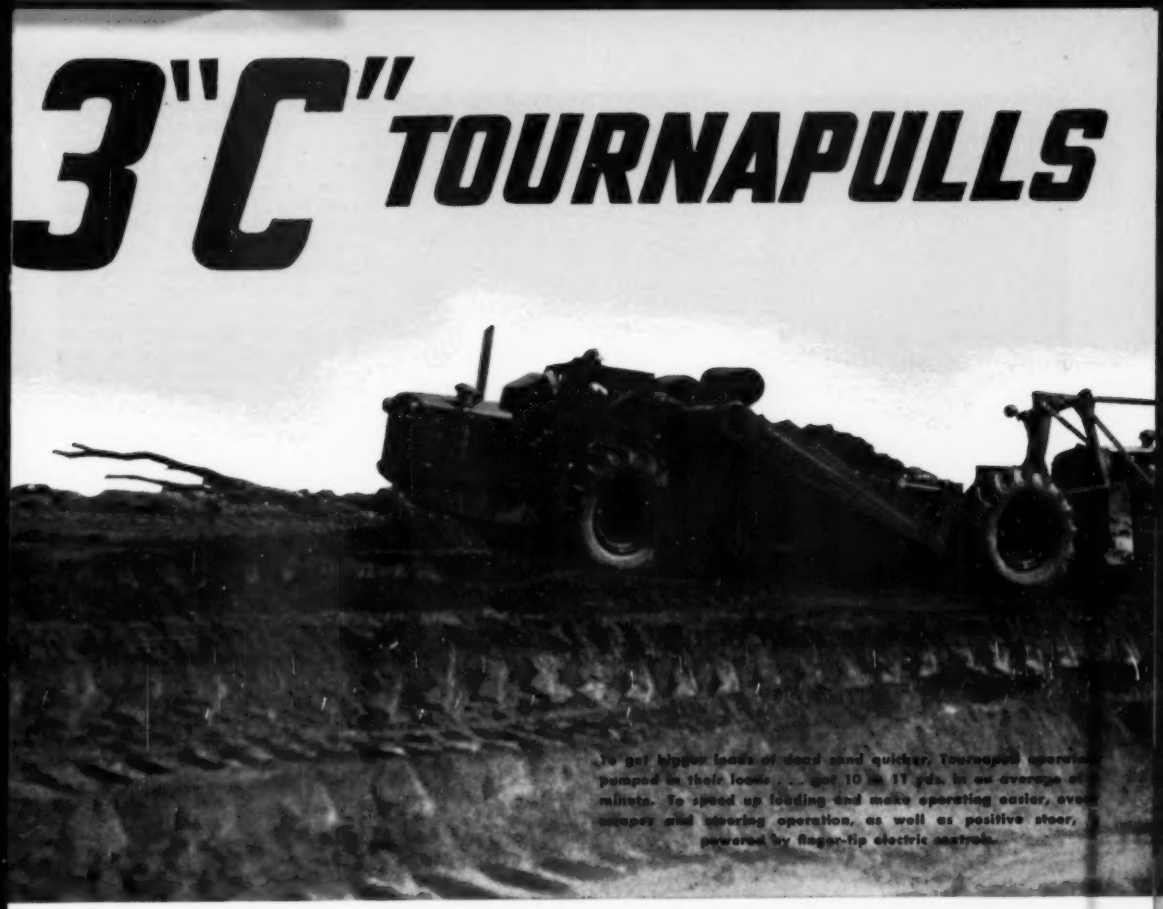
NAME ..... TITLE .....

COMPANY ..... TYPE OF BUSINESS .....

STREET ..... CITY, STATE .....

Would also like information on ☐ 7-yard "D" ROADSTER ☐ Big 30-yard "B" TOURNAPULL

3 "C" TOURNAPULLS



To get bigger loads of dead sand quicker, Tournapull operator pumped in their loads . . . got 10 to 11 yds. in an average of minute. To speed up loading and make operating easier, ever scraper and steering operation, as well as positive steer, powered by finger-tip electric controls.

Complete Each Job Faster . . . Handle More Jobs per Season

This ability to move big yardages per shift . . . in all types of scraper materials . . . under tough working conditions is the reason why many leading contractors, like McLean-Astleford, are turning to the new electric-control Tournapulls for bigger profits. The 150 h.p., 13-yard "C" is ideal for grading sub-divisions, factory sites, extending airport runways, widening shoulders, stripping and working pits and mines, maintaining railroad rights-of-way, stockpiling coal for industry . . . is easy to keep busy between major jobs and for year-round operation. High speeds up to 17.3 m.p.h. plus ability to travel job-to-job cross country or over pavement increases its earning ability. It gets to your job quicker . . . finishes sooner . . . moves on to next job without shipping delays and expenses.

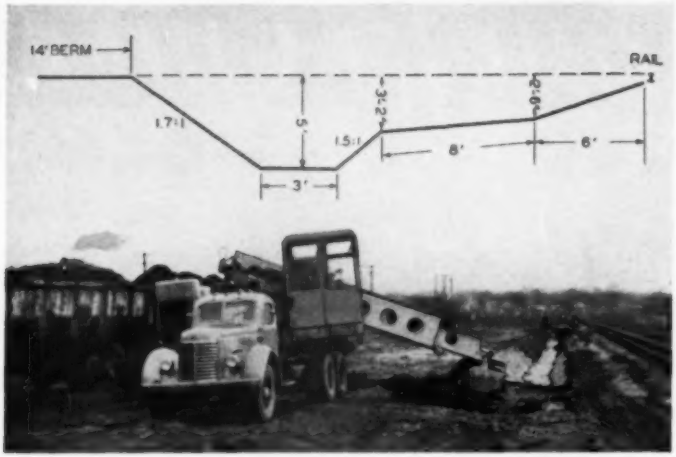
Check Profit Possibilities Available TO YOU

Don't wait another day to investigate the extra profits this modern, high-speed, rubber-tired "C" Tournapull can earn for *you*. See your local LeTourneau Distributor NOW for complete facts and figures on performance, price, and delivery.

Tournapull-Trademark Reg. U. S. Pat. Off. R135

LETOURNEAU PEORIA, ILLINOIS (HIGH-SPEED RUBBER-TIRED) **TOURNAPULLS**

MORE YARDS PER HOUR WITH RUBBER-TIRED POWER



• Ruth Lumber & Supply Company, Scottsdale, Pa., reports its ½-yd. Warner-Swasey Gradall is removing and loading 35 to 40 cu. yds. per hour on this contour ditch (diagram in color) through clay, loam, slag and cinders at Bedford, Ohio — performing work previously done by hand labor.

News

Continued from page 36

of the Sponsors' Council of the U. S.-U. K. on Unification of Screw Threads, set in motion the governmental machinery which resulted in the agreement. At that time gun parts of the three countries of identical design could not be fitted together because of the 5-degree angle difference in screw threads. This minor difference necessitated sending along spare parts with lend-lease equipment shipped abroad. Engineers quoted by the New York Times estimate that the small difference in thread angles added some $600,000,000 to the cost of the war.

A temporary wartime standard was adopted but expired with the termination of hostilities. The problem was referred to the above groups, and representatives of the three nations came together under the auspices of the Sponsors' Council, which worked out the final agreement.

N.Y. Road Contracts Total $85 Million

A total of 156 contracts for construction or rebuilding of 566 miles of highways amounting to $85,073,000 was let during 1948 by the New York State Public Works Department. The department's own forces widened and resurfaced 204 miles of state highways.

Cost of work put under contract in 1948 was 60% greater than in 1947. Since the war's end, $195 million worth of highway construction has begun.

Modernization Ups Output Of Swedish Cement Plant

Modernization of machinery and equipment is bringing to 800,000 tons the annual output of limestone crushed annually by the Slite Cement Och Kalk Aktiebolag, Slite, Sweden. Located on the Island of Gotlard in the middle of the Baltic Sea, Slite is situated on a bay which affords a fine natural harbor.

The location is ideal for the high production of cement because the whole island is limestone rock, its composition almost correct for cement manufacture. The plant now uses 95 per cent of one type of limestone containing 78 per cent calcium carbonate and 5 per cent of high grade limestone containing almost 97 per cent.

Production progresses from the quarry through the plant and on to the docks where the cement is loaded.

The face of the quarry is from 50 to 90 feet high, blasting done on a whole side at one time. The company uses air-driven drills, the whole machine going down into the 6-in. hole on a special rubber line and chain.

Hauling is by 15-ton Euclid rear-dump trucks loaded by two 2-yd. Ruston-Bucyrus electric shovels and one diesel-powered 2-yd. P. & H. shovel. The haul between the shovels and the crusher is short, only 300 feet; the round trip from 600 to 800 feet. Prior to present operations, rail haulage was replaced a few years ago by diesel-tractor-drawn side-dump cars running on a steel band.

A new pier and a new cement silo (capacity, 15,000 metric tons) went under construction last year. The height of the cement silos being used is 130 feet; diameter, 65 feet. When loading to the ships, a small amount of air is let into the silos to make the cement flow easily to a rubber belt which takes it to the pier and on to the boat. Maximum loading capacity is 500 metric tons an hour.

The cement is made by the wet proc-

• A general view of the quarry at the Slite, Sweden, cement plant shows two 15-ton Euclid rear-dump trucks, one going to the crusher with a load of limestone, the other returning to the shovel.
• Inset shows a 2-yd. Ruston-Bucyrus shovel loading to one of the Euclids.

• John Arborio has a million-yard excavation job in construction of N. Y. highway 17-K from Middletown to Fair Oaks. This 2½-yd. Bucyrus-Erie 54-B shovel is loading out 2,000 yds. per shift to Euclid wagons.

ess. The plant has four kilns operating with a total output of 8,600 barrels a day. The fourth kiln was installed recently.

Because of the coal shortage in Sweden, the plant uses oil most of the time. It was forced to build its own large oil tanks to store the huge quantities of oil needed.

Overpass Highway Bridge Goes Up in Illinois

By D. A. Hoover

A 4-lane highway bridge on U. S. 66 overpassing railroad tracks about a mile north of Litchfield, Ill., is going up, one crane handling varied jobs on the project. J. C. Bremer of Hillsboro, Ill., holds the contract.

Excavation amounted to 1000 cu. yd. to provide pits for footings of bridge piers. A Bucyrus-Erie 22-B crane equipped with a ¾-yd. dragline bucket handled the digging. After the bridge is completed, excavated dirt will be used as fill in the approaches.

Because the ground was soft and muddy after drenching rains, it was impossible to construct forms in position. They were made up on solid ground. The 22-B swung them into place, following them with reinforcing steel wired into mats which were lowered into the standing forms. As soon as one pier was poured and the concrete set, the crane pulled off the forms in sections and placed them into position for the adjacent pier.

Dry concrete mix was hauled to the job by 1½-ton GMC dump trucks and discharged directly into the loading apron of a 2-yd. Foot 27E paver. The paver emptied mixed concrete into a 1-yd. Blaw-Knox concrete bucket which the crane hoisted to the tops of the forms.

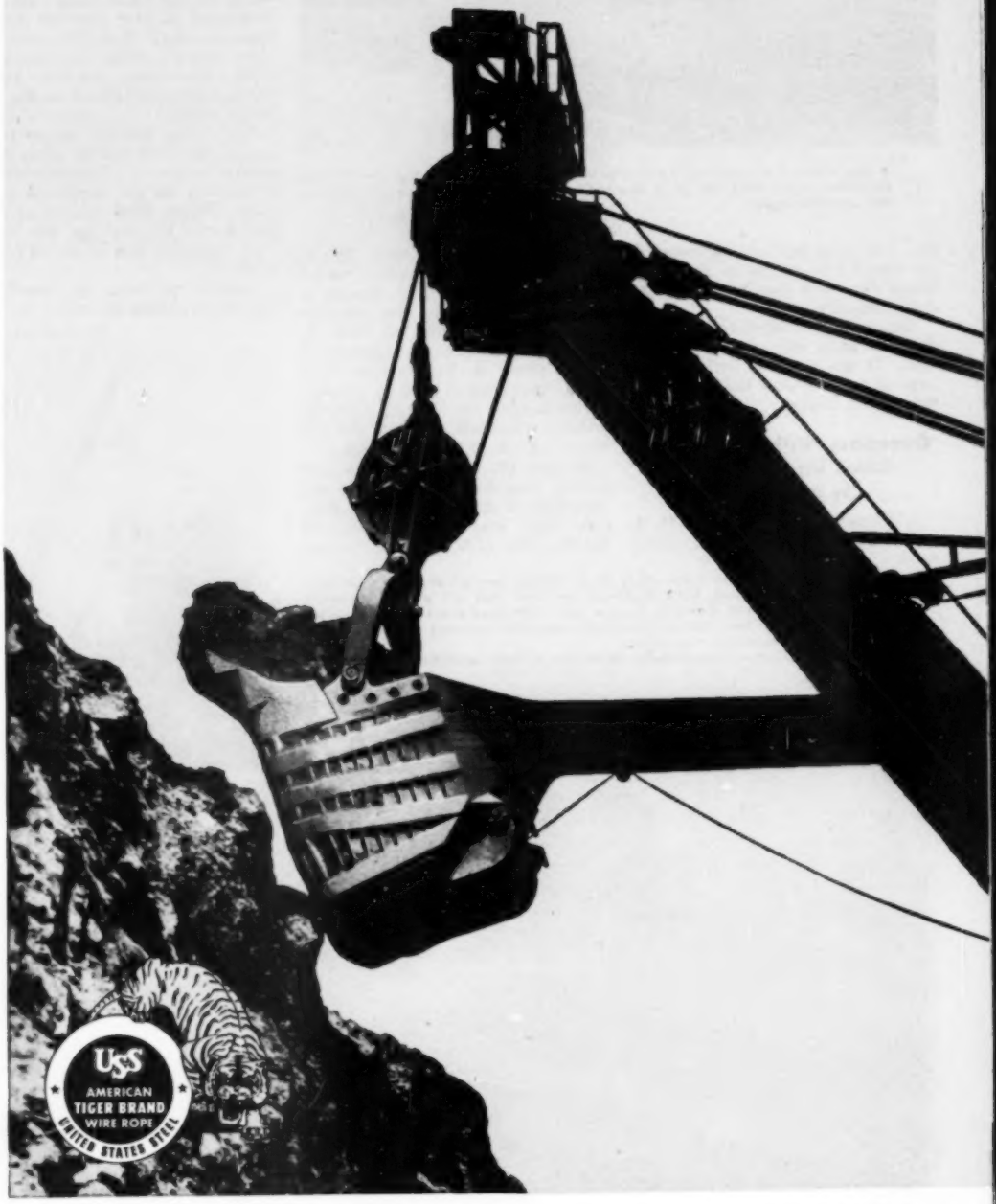
When steel for the superstructure arrives, the 22-B will be again called into use to remove it from railroad cars to position on the completed bridge piers. Forms, steel reinforcing mats and mixed concrete for the bridge floor lanes will also be moved by the 22-B.

Another problem, not specifically part of the project, was solved by using

Continued on page 44

• Below: Dry concrete mix is brought to site of highway overpass bridge near Litchfield, Ill., by 1½-ton GMC truck which discharges into 2-yd. Foot 27E paver. Bucyrus-Erie 22-B crane will swing 1-yd. Blaw-Knox concrete bucket with mixed concrete to forms. To left are completed piers. Steel sheeting (foreground) was driven by crane and pile driver to prevent railroad embankment from sliding.
• Right: Crane positions concrete bucket above chute to begin pouring of pier.

How the proper application



# of wire rope

-may save you money

● Every user wants to get the best possible service out of his wire rope but it is amazing how often simple rules are broken in the field. Some operators are careless when installing a new rope . . . they keep machines running when sheaves are badly worn . . . they overload the rope . . . they forget to lubricate the rope.

To help eliminate these human failings, the American Steel & Wire Company maintains a staff of TIGER BRAND Wire Rope Specialists. These men are experienced field service engineers. If you have not checked your equipment recently, for correct wire rope application, call in the TIGER BRAND Specialist. He'll do the job for you without charge. Here are some of the points he checks before recommending the proper wire rope for your job—

1. Method of installing and caring for rope.
2. Diameter of sheaves and drums, and condition of grooves.
3. Arrangement of sheaves.
4. Fleet angles.
5. Loads handled.
6. Rope speeds, acceleration and deceleration.
7. Presence of vibration, whipping.
8. Lubrication.
9. Corrosion.
10. Amount of scrubbing and abrasion.
11. Fitting attachments.
12. Abuses to be corrected.
13. Analysis of service records.
14. Finally: Recommendation of the correct rope to meet all conditions.

To show you how you can save money on wire rope, we have prepared a booklet on proper wire rope application that every user of wire rope should read. You can get a copy by mailing the coupon.

AMERICAN STEEL & WIRE COMPANY, GENERAL OFFICES: CLEVELAND, OHIO
COLUMBIA STEEL COMPANY, SAN FRANCISCO
TENNESSEE COAL, IRON & RAILROAD COMPANY, BIRMINGHAM, SOUTHERN DISTRIBUTORS
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AMERICAN TIGER BRAND WIRE ROPE

Excellay Preformed

UNITED STATES STEEL

Continued from page 41

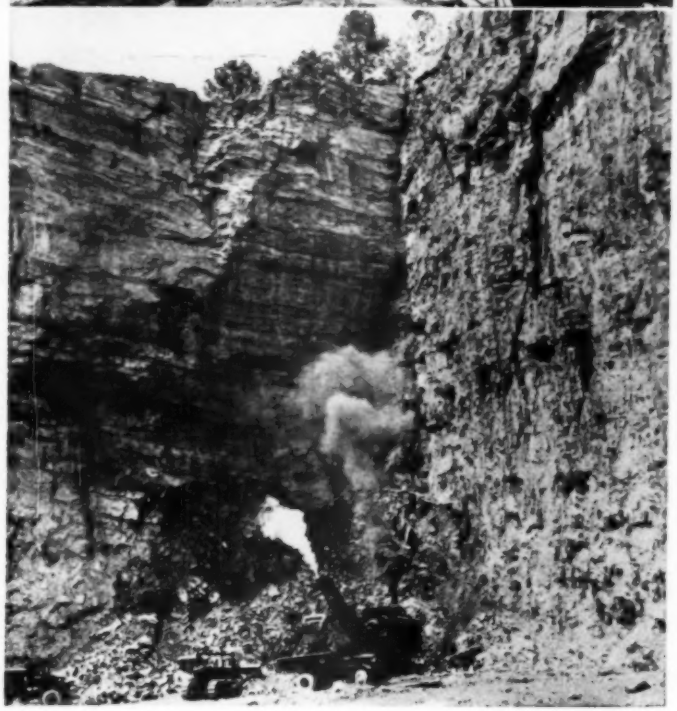
the crane. Considerable earth was removed close to the railroad tracks, putting the raw embankment in danger of sliding because of the heavy rains. The crane, using a conventional pile driver, drove steel sheeting to make a continuous cribbed retaining wall. Sliding was adequately prevented.

AGC Charters Two Chapters

Two new chapters have been chartered by the Associated General Contractors of America, one in Alaska with headquarters in Anchorage, the other in New Mexico with offices at Albuquerque.

Ten construction companies, resident or operating in Alaska are charter members of the Alaska chapter, with R. H. Stock of Stock and Grove, Inc., as president, and E. W. Dunn of Birch, Johnson and Lytle Co., as manager. The New Mexico chapter, known as the Associated Building Contractors, has Alva J. Coats as manager.

Addition of these two chapters brings to 105 the total number of chapters in the organization. Nearly 5,000 construction firms, engaged in all types of construction work—highway, building, heavy and railroad construction—are members of AGC.



Virginia Highways Lose Covered Bridges

The picturesque covered bridges, a part of the romance of the past, are fast disappearing from the highways of Virginia. Only nine remain in service, while the 10th, the oldest still standing, is falling into ruins on an abandoned road section.

Granddaddy among Virginia's surviving covered bridges is Old East Humpback located on abandoned Kanawha turnpike in Alleghany County. Erected in 1828, the heavy timbers of this 100-ft. walled bridge are sound, but its weather boards are slowly rotting.

The oldest bridge still in service is a 60-ft. truss structure crossing Seneca Creek in Campbell County. Built in 1878, it is marked for replacement in the near future. Another 191-ft. old timer, spanning the Shenandoah River, has carried traffic since 1893, is strong enough to last for years. Both are on secondary roads.

Only one covered bridge, high on the "must go" list, is still in service on a primary road. Stretching across the Jackson River, its two 106-ft. trusses are bolstered by timber supports.

Demands of modern traffic are too heavy for the antiquated timber structures. Virginia's first was built in 1820, and, although only a few remain there, recent ARBA surveys show that Ohio has 592, Pennsylvania 336, New England states 300, and Indiana 194 covered bridges still standing.

Belt Moves 350 Tons of Limestone Per Hour

The first quarry conveyor belt in the Virginia area, a recently-installed 4-flight Goodyear belt is currently transporting 350 tons of crushed limestone rock ¾ of a mile through the

Continued on page 54

• Top: Flight No. 2 of the ¾-mile Barber-Greene conveyor with Goodyear belt built recently for the Blue Ridge Stone Corp. near Roanoke, Va., runs 1,300 feet across the quarry floor, spans a work road and lifts 55 feet to the rim of the quarry, where it delivers to flight No. 3. Two 15-ton Euclid trucks (background) haul limestone to the crusher.

• Bottom: A Marion 37 steamer, one of two steam shovels in the pit, loads rock to Euclids at base of 200-ft. quarry face. Tractor (center) is an International TD-18 equipped with a Heil dozer.

WAGONJACKS and CARSET JACKBITS

THEY GO TOGETHER

WAGONJACKS and CARSET BITS make a perfect drilling combination for the contractor. They go together. Maximum benefits are obtained only when one is used with the other.

WAGONJACKS were designed to give the contractor a lightweight wagon mounting featuring long steel changes . . . positive feeding pressures . . . maneuverability and a powered frame elevator . . . all of which reduce operator fatigue.

The Ingersoll-Rand CARSET BIT is recognized as a revolutionary development in the rock-drilling field. It is extremely long wearing and fast drilling. One Carset Bit will often drill several hundred feet of hole in hard rock. Elapsed drilling time is frequently cut in half. In addition, time is saved that is normally required to remove a dull bit and replace it with a sharp one. Reconditioning of bits is practically eliminated. The I-R Wagonjack and I-R Carset Bit combination make new drilling records. *They go together.*

Wagonjacks and Carset Bits are available for immediate delivery. Call the nearest Ingersoll-Rand branch office for full details.

Demand the

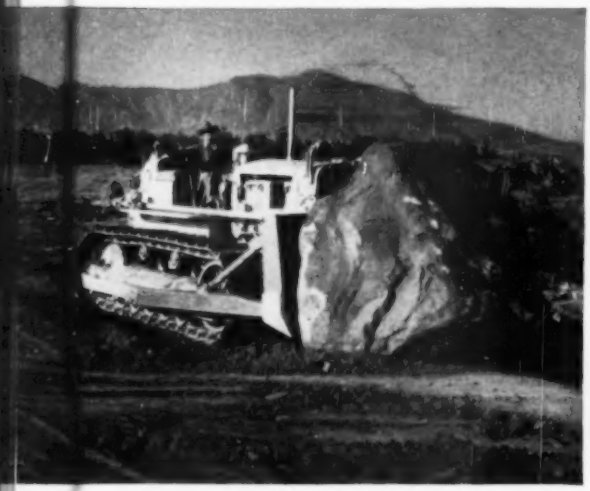
IR CONTRACTORS' COMBINATION . . . Top quality machines that work as a team.
Machines designed, built, sold, and serviced by
men who know rock excavation . . . application "know how"

Ingersoll-Rand

11 BROADWAY, NEW YORK 4, N. Y. 291-5

Changing the channel of the Yakima River, near Ellensburg, Wash., this "Caterpillar" Diesel D7, with No. 7S Bulldozer, works in 3 feet of water, doing a difficult job with ease.

On a highway job near Hampshire, Tenn., this "Caterpillar" Diesel D8 Tractor with No. 8S Bulldozer operated at 1½c per yard lower maintenance cost than a competitive tractor.



A "Caterpillar" Diesel D7 and No. 7S Bulldozer clearing rocky land for a citrus grove, Santa Paula, Calif. Operator says: "This is the neatest operating 'dozer I've ever worked with."

A "Caterpillar" Diesel D6 Tractor with No. 6A angling-type Bulldozer, is shown here building dike for a big new irrigation system in the Rio Grande Valley near Eagle Pass, Texas.

Top-Dog in the

Three years ago the "Caterpillar" Bulldozer entered the earthmoving picture. Since then thousands of contractors have used it on their jobs—proved its toughness—checked its big yardage and low operating costs. From coast to coast they talk about its ease of adjustment, its freedom from overhead structures, and the excellent rolling action that's built into the blade. Today, more than ever, this rugged unit is hailed everywhere as Boss of the Bulldozers.

Designed and engineered as perfect teammates for the power of "Caterpillar" Diesel Tractors, "Caterpillar" Bulldozers are now available in a complete line of both cable-controlled and hydraulic-controlled units. See your "Caterpillar" dealer for full particulars. He can also supply you with information on how these revolutionary 'dozers can be used with tractors of other makes.

CATERPILLAR TRACTOR CO. • PEORIA, ILLINOIS

'Dozer field

This "Caterpillar" Diesel D8 Tractor with No. 8S Bulldozer handles 6000 to 8000 tons of sand and gravel daily at the Henry J. Kaiser plant, Pleasanton, Calif. Supt. B. F. Carter says: "'Caterpillar' equipment stands up better and does a better job. Wouldn't have anything else."

CATERPILLAR
REG. U. S. PAT. OFF.
DIESEL

ENGINES • TRACTORS
MOTOR GRADERS
EARTHMOVING EQUIPMENT

UN Headquarters

Continued from page 28

and sound conditioning, the Assembly Hall, the Council chambers and conference rooms and over 300 radio booths will be equipped with more than 500,000 square feet of sound absorbing material.

The problem of clearing snow and ice from the area will probably never come up. Planning engineers have recommended that the miles of walks, roadways and ramps in and around the headquarters buildings contain pile coils through which warm liquid mixed with anti-freeze will flow, melting snow and ice as fast as it forms.

A list of heavy equipment used for demolition and excavation on the site follows.

Shovels:
- 2 2-yd. Lorain 802's, powered by Caterpillar 17000 diesels
- 1 2½-yd. Northwest 80D, powered by Murphy diesel
- 1 1½-yd. Bucyrus-Erie 38-B

Truck Cranes:
- 1 15-ton Lorain Mc-414, powered by Waukesha gasoline engine
- 1 18-ton Koehring 30-H powered by Buda gasoline engine

Bulldozer:
- 1 Caterpillar D-8

Trucks:
- 11-yd., 10-wheel Macks LJ, diesel-powered
- 10-yd., 10-wheel Macks NR, diesel-powered
- 8-yd., 6-wheel Macks BX, gasoline-powered

Compressed Air Equipment:
- 4 Gardner-Denver 500-cfm diesel compressors
- 2 Gardner-Denver 315-cfm gasoline compressors
- 8 Gardner-Denver handheld drills
- 6 Gardner-Denver wagon drills

The UN Gets Its Home

Little known is the story of the 11th hour purchase of a site suitable as the permanent headquarters for the United Nations. It was not until approximately 7:30 PM on the night of Dec. 10, 1946, that the Rockefellers first had the idea of buying and giving to the UN the East River site. On the next day, at 10:30 AM, the General Assembly would have met and most likely voted for Philadelphia as a last-ditch compromise after an 11-month search had failed to turn up a site geographically satisfactory at a price the UN could afford.

Deeply interested in the success of the United Nations, the Rockefellers gathered at noon on the 10th to consider donating a suitable New York site to the world organization. Too, as native New Yorkers they wanted the UN to stay in the big metropolis, considered the best location after UN delegates approved the East Coast of the United States for the World Capital. During the afternoon, negotiations were almost complete to give the UN Rockefeller property, the Rockwood hall area on the Hudson River near Tarrytown.

Shortly after seven that evening, Nelson Rockefeller called his father telling him of these plans. Answering a question he said that, although their property was the best available site, it was not the ideal one. The ideal location was on East River in midtown Manhattan, the site chosen for the then proposed $150 million "Dream City" of skyscrapers. The property was valued at $25 million, but it was known that it was available to the UN for $8½, still much more than the UN could spend. In that moment, reminded of these facts, John D. Rockefeller, Jr., authorized purchase of the "ideal" site.

The wheels of wealth began to turn and all through the night negotiations proceeded. The City of New York promised rights to intersecting streets and adjacent lands. By 10:30 AM the next morning, delegates were told that the "Dream City" was theirs. They accepted the generous gift on December 14.

National Society for Crippled Children and Adults, 11 So. LaSalle St., Chicago 3, Ill.

"I don't care if you can't get a spare part for a week: Give Butch his erector set back."

Phoenix

Continued from page 23

the excavation work. Major valve vault excavations were put down by a Warner-Swasey Gradall excavator. Excess material was loaded by Athey loaders. Both Arizona Sand and Rock, and Fisher used Caterpillar graders and tractors.

Haulage Problem Minor

Although about 20% of the excavated dirt had to be hauled away, the haulage problem was minor. Usually nearby property owners were glad to get the dirt for fill, and only a small percentage had to be hauled to dumps outside city limits.

In the downtown area where many subsurface obstructions were encountered ditchers averaged 600 lineal feet every eight hours. The average in the residential sections was higher.

Dirt around obstructions was loosened with Ingersoll-Rand and Worthington spades. It was thrown away from the obstructions by hand labor. A clamshell then lifted it from the bottom of the excavation to the spoil bank beside the trench.

Water Connections

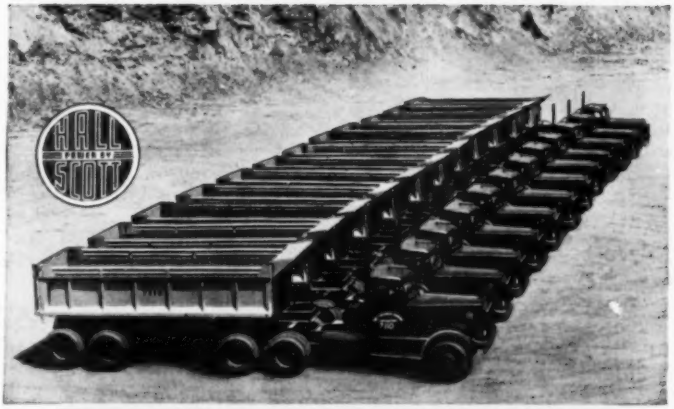
Problems of laying the pipe did not end when obstruction difficulties were overcome. New pipes had to be connected to the old lines without shutting off the water. Most of these connections were handled by jumping in the new connections wet, with contractors using 3-in. diaphragm and 6-in. centrifugal Rex pumps to hold down the flow of water from valves which were only partially closed. Domestic service went on uninterrupted while these connections were made.

Construction of the other new supply units progressed as the pipeline was installed. The water filter plant at the Verde River and the booster station are in the very last stages of construction while the new reservoir has been completed.

Water Filter Plant

The 30-mgd water filter plant at the Verde will be finished this spring. Its primary purpose is to guarantee an adequate water supply regardless of the condition of the river. In the past the city's water supply has been seriously reduced when the river was in a muddy flood stage.

Because of the rugged terrain in



HALL-SCOTT ENGINES
helped move 5 million yards
. . . set new handling record

● These twelve Peterbilt trucks, powered by Hall-Scott Series 400 engines, helped the Guy F. Atkinson Company move 5 million yards of earth 4½ miles from pit to fill in the expansion of Mills Field, San Francisco's airport.

The objective: Economy through *speed* and *dependability* of equipment.

The result: A million yards a month! The Hall-Scott-powered tractors showed particular ability. Speeds up to 45 m.p.h. over the haul road, carrying 22 yards of dirt, were routine.

Performance like this is no news to Hall-Scott users. For extra power and dependability, get the details on the Hall-Scott "400." Gasoline or butane equipped.

HALL-SCOTT
MOTOR DIVISION
ACF-BRILL MOTORS COMPANY
Factory and Main Office: Berkeley 2, California
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Branches:
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Chicago
Dallas
Los Angeles
Berkeley

which the plant is located an unusual arrangement of units was required. The chemical building, settlings basins and filter buildings were set at different levels to reduce excavation. The contract for the excavation went to Arizona Sand and Rock and the Del Webb Construction Co. for $1,157,940.35. The firm of Headman, Ferguson and Carello served as consulting engineers.

Midway between the Verde River and the city reservoir a booster station is being installed in the transmission main. This plant will increase the capacity of the existing 48-in. pipeline from 30 to 46 mgd. The booster station is a temporary expedient which will be replaced sometime in the future by a parallel main line throughout the 35 miles. The booster has 1,000-hp installed capacity with pumps able to deliver 46 mgd against a head of 130 feet. To permit flexibility of operation a combination of motors is being installed to permit operation at three separate speeds of 585, 690 and 890 rpm.

The contract for the booster station totalled approximately $200,000. The general contract was let to Walsh and Son for $82,543.75; electrical installations to Corbin and Davis for $43,857.-14; balance of electrical equipment including transformers and switches to General Electric for $31,532.92, and the pumps and motors to Byron and Jackson Co., for $31,692.

Vinson Construction Co. held the reservoir excavation and construction contract for $145,945.95 while Allison Steel Co. held the contract for the steel roof of the new reservoir, for $111,019. The 20-mgd reservoir consists of earth-filled banks with gunite lining. Along with the water distribution system, it was designed by Johannesson and Girand and Yost and Gardner.

No labor camp was put up during any part of the project. While operations were going on at Verde River, men traveled back and forth daily for each shift in busses.

Spillway Gates

The $6-million bond issue also includes the building of spillway gates at Horseshoe Dam 60 miles away. Plans are not yet complete, but cost is expected to run to $800,000. The gates will be 35 feet high and impound 75,000 acre feet additional storage. This storage will increase the city's water supply by an average of 15,000 acre feet or five billion gallons a year.

Although the $6-million bond issue was originally planned to carry Phoenix through 1955, growth has been so rapid that by 1948, the designed loads had exceeded the predictions for 1955. As a result, the city has just voted an additional $3½ million for expansion, a great part of which will be used to construct the parallel line from the Verde, replacing the booster station.

Provides Performance Never Before Attainable In Small Type Excavating Equipment

Model 310 General ¾ Cu. Yd. Power Shovel.

Among the numerous advantages of this new type, crawler mounted GENERAL are 100% air control of basic motions through an air actuated, finger touch lever system . . . "Air Cushion Clutch" on reversing and retract mechanisms . . . bigger, easier operating brakes . . . larger shafts and liberal use of anti-friction bearings . . . deck gears recessed, fully enclosed, and running in oil . . . live, independent, worm driven boom-hoist with power up and power down for Crane, Dragline, and Clamshell service . . . independent travel, two speeds in either direction, steers without stopping . . . drumshaft operates in anti-friction bearings and end is capped with a lifetime, dustproof, GENERAL designed seal.

The GENERAL MODEL 310 is available with independent chain crowd shovel boom assembly, with crane boom for clamshell, dragline, and hookblock work, and as a hoe. Boom assemblies can be changed with a minimum of effort in the field.

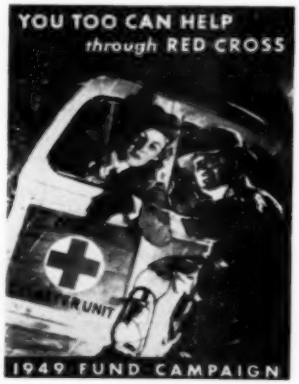
●

These new features with the many others provided on the Model 310 give you increased earning power which will pay for the cost of the machine in a very short time. Write for complete details.

POWER SHOVELS • CRANES • DRAGLINES • CLAMSHELLS • BACKHOES • PILE DRIVERS

THE OSGOOD CO. O-G THE GENERAL CO.
EXCAVATOR
MARION OHIO

DIESEL GASOLINE OR ELECTRIC POWERED • ⅛ TO 2½ CU. YD. • CRAWLERS & MOBILCRANES



Blasting

Continued from page 19

crusher size. Secondary drilling is reduced more than 50%.

Some of the accompanying photographs will show the difference in results obtained today as compared to instantaneous blasting. The pictures also show an entirely different action taking place as the blasts are fired by the two methods.

Try Different Methods

Probably there are some who are skeptical regarding this method of blasting, because one or two test shots have not produced the results expected. In my opinion, there is not a blasting problem in any quarry that cannot be greatly overcome and "licked" if it is approached from a scientific angle. Instead of giving up hope after one or two blasts, continue trying different methods until the right one is found.

Better fragmentation and reduced vibration can be obtained by any delay method used, whether the blast is fired with a switch, timer, delayed caps or any other means of producing a slight interval between the holes as they fire. The only advice I have to offer is to keep on trying until you have found the method that works best in your particular stone. Once this has been accomplished, the method will start paying real dividends.

HAYWARD BUCKETS

WON'T QUIT OR CAUSE TIME OUT

A Hayward Bucket keeps the job going ahead on scheduled time. It won't quit or cause time out.

THE HAYWARD CO.
52-54 Church Street
New York, N. Y.

"Safer Stops... 33% Longer Brake Life!"

...says Henry Melig, veteran 4-state hauler

Henry Melig, Milwaukee, Wis. — who has handled all kinds of hauling jobs in Wisconsin, Indiana, Illinois and Iowa for over 29 years, says: "Our two La Crosse trailers have the best brakes of any trailers we use. They're bigger, more rugged . . . give faster, more dependable stops. Best of all, *we only need to reline them every 3 years, compared with every 2 years for brakes on our 5 other trailers.* Our oldest La Crosse is 9 years old . . . and is still going strong after 200,000 tough miles."

You, too, will get extra miles of low-cost service with La Crosse.

LC-3

Single, Dual, Tandem Axle models to 100 tons cap. . . . also 6 to 10-ton tilting trailers.

Check Today!

LA CROSSE TRAILER CORPORATION, La Crosse, Wis.

☐ Rush complete details on LaCrosse Trailers ☐ I may be interested in a.....ton trailer about..... (date)

for hauling..... (type of equipment)

Name.....Title.....

Employed by.....

Address.....

City.....State.....

LaCROSSE

Low-Cost TRAILER TRANSPORTATION

NOT in the *Contract*

The aspiring policeman was undergoing his examination. "Now imagine," said the examiner, "that you met a charming young lady late one evening, who tells you that a strange soldier has embraced and kissed her. What would you do?"

The candidate did not hesitate in his answer.

"I should endeavor to reconstruct the crime — with the young lady's assistance, of course, sir."

Said the bride: "Of course, twin beds are all right, but there is no use in us buying them until (and here she blushed prettily) we get the twins!"

Shovel Runner: "I wish I had some pain killer to cure this toothache."

Foreman: "It's all a matter of mind. Yesterday I was feeling terrible. But when I went home, my wife put her arms around me and consoled me, and in no time I was feeling great."

Shovel Runner: "Is your wife home now?"

Patient: "Doctor, are you sure this is pneumonia? Sometimes doctors prescribe for pneumonia and the patient dies of something else."

Doctor: "When I prescribe for pneumonia, you die of pneumonia."

Three small boys were bragging about their fathers. The first boy said: "My dad writes a few lines on a paper, calls it a poem, sends it away in the mail, and gets ten dollars for it."

"My dad," spoke up the second, "makes some dots on a piece of paper, calls it a song, sends it away and gets 25 dollars for it."

"That's nothing," declared the third lad. "My father makes a few scribbles, gets up in the pulpit and reads them— and it takes four men to bring in the money!"

"Will you think of me always, Darling?" asked the charming little bride.

"I can't lie to you, dear. I'll try, but occasionally I might wonder if the Dodgers will win the World Series."

"Are you boys SURE you can fix my zipper?"

A Washington matron once boasted she could make Calvin Coolidge talk. Cornering him at a dinner, she sought to make good her boast.

"Oh, Mr. President," she said, trying to disarm him with frankness, "I have made a bet that I can make you say at least three words."

"You lose," Coolidge replied.

Young Miss Brown had just been prepared for the operation and placed on the stretcher to wait her turn outside the operating room. While she was left alone a man in a white smock approached, lifted the sheet, peeked under and left. Still another approached and peeked under.

That was entirely too much so she asked the young man: "What am I here for, Doc, observation or operation?"

He replied: "You'll have to ask the Doc. — I'm the painter down the hall."

A minister told his flock he had a "call" to go to another church. One of the deacons asked how much more he was offered. "Five hundred dollars," was the reply.

"I don't blame you for going," remarked the deacon, "but you should be more exact in your language, Parson. That isn't a 'call,' that's a 'raise.' "

Greatly agitated, a woman carrying an infant dashed into a drug store. "My baby has swallowed a bullet," she cried. "What shall I do?"

"Give him the contents of this bottle of castor oil," replied the druggist calmly, "and then be sure you don't point him at anyone."

The old Irish contractor, returning from a visit to his home country, was passing through customs.

"Do you have anything to declare?" asked the customs officer.

"Only a bottle of water," the contractor replied.

"What kind?"

"Holy water."

Long experience had taught the officer to take nothing for granted so he asked to see the bottle. The contractor protested, but the customs man snatched it from him and took a whiff of the cork.

"It's whiskey!" he cried.

"Glory be!" exclaimed the old contractor fervently, "a miracle!"

HOW BUCYRUS-ERIE BLAST HOLE DRILLS CAN SAVE YOU MONEY

More Footage Per Shift

There's no secret behind the greater drilling footage provided by Bucyrus-Erie blast hole drills throughout each shift. Take a look at the story:

1. **Fast, Steady Drilling Motion.** Accurately timed drilling action produces more effective blows per minute . . . permits tools to strike with maximum force. Stroke length may be varied to fit the formation.

2. **Rapid Penetration** results largely from a derrick-head rubber shock absorber that gives the tools extra reach, then instantly snaps them back the moment the blow is struck. With maximum penetrating power thus concentrated on the hole bottom, faster rock preparation is assured.

3. **Properly Fitted Tool Weights,** with weights determined by the type of job to be handled, also help insure shattering drilling blows for more footage per shift at less cost per foot. Each model Bucyrus-Erie rig has ample capacity to do the most effective drilling job in its size range.

BUCYRUS ERIE

SOUTH MILWAUKEE, WISCONSIN

It will pay you to check these Bucyrus-Erie blast hole drills when you plan your new equipment purchases:

22-T	5⅞"	to 6⅝"	holes
27-T	6"	to 6⅝"	holes
29-T	6"	to 9"	holes
42-T	9"	to 12"	holes

Gasoline or electric power is available for all machines, diesel for all except the 22-T.

22-B46C

THEY Roll Along on ROGERS TRAILERS Everyday Everywhere

MORE AND BIGGER LOADS

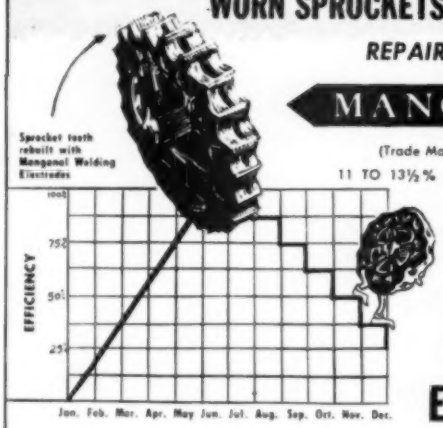
An impressive number of the biggest contractors TODAY repeatedly put their confidence in ROGERS TRAILERS long proven ability to "deliver the goods" and "stand the gaff" over long periods of heavy usage.

Smaller operators, too, find in the extensive ROGERS LINE, the answer to their particular trailer requirements with proper capacity, road clearance, type of construction and strength with lightness.

We solicit inquiries which make your trailer problems our problems and we generally come up with the correct answer.

ROGERS BROTHERS CORPORATION
DESIGNERS and BUILDERS of HEAVY DUTY TRAILERS SINCE 1915
136 ORCHARD ST. ALBION, PENNA.

WORN SPROCKETS SLASH PROFITS!
REPAIR with
MANGANAL
(Trade Mark Reg. U. S. Pat. Off.)
11 TO 13½ % MANGANESE-NICKEL STEEL



Bare or Special Tite-Kote WELDING ELECTRODES

WRITE FOR YOUR FREE COPY OF THE "MANGANAL MARKETER"

Weld deposits made with MANGANAL WELDING ELECTRODES wear longer. They are genuine Manganese-Nickel Steel, with alloys in the rod itself, not in the coating. MANGANAL deposits workharden up to 550 Brinell under impact and abrasion and polish in use, cutting wear on steel which contacts them. MANGANAL'S high tensile strength (up to 15,000 p.s.i.) prevents spalling. Extreme toughness for outlasts other steels. Produced in 1/8", 5/32", 3/16", 1/4" and 5/16" diameters, 18" lengths; 50 lb. packages.

STULZ-SICKLES CO.
SOLE PRODUCERS
91 N. J. Railroad Ave. Newark 5, N. J.

NAME OF NEAREST DISTRIBUTOR ON REQUEST

News

Continued from page 44

state's Blue Ridge country from the quarry of the Blue Ridge Stone Corp., near Roanoke, Va., to the processing plant. The first three flights haul stone to the stockpile while the fourth delivers stone from the stockpile to the plant.

Several unusual installation problems were met during construction.

Tail end of the No. 1. belt, which is 42 inches wide, tunnels under the quarry floor to receive 10-in. lumps from the primary crusher, then lifts 47 feet to the secondary crusher. Here the load transfers to the second belt, travels 1,300 feet, spans a work road, and elevates 55 feet to the quarry rim to discharge to the quarry rim onto Flight No. 3.

This belt speeds through an underpass beneath U. S. Highway 460 before swinging upward on a 1,025-ft. radius to unload on a stockpile 70 feet high. The fourth belt tunnels under the stockpile to receive its load from a remote-controlled feeder gate and runs 1,600 feet to the finishing plant. The last three belts are each 30 inches wide.

The system is powered by three 50- and one 40-hp motors. Idlers, structure and machinery are Barber-Greene equipment.

Before the belt was constructed, six dinkey railroad engines struggled up a 6% grade with loaded cars along six miles of track. The belt system maintains a stockpile 24 hours ahead of finishing plant needs, enabling the plant to operate independently of the quarry. The processed limestone is used as a highway building material and ballast for rail roadbeds.

Central Valley Projects Make Good Progress

Two main irrigation arteries in California's Central Valley project — Friant-Kern and Delta-Mendota Canals flowing up the east and west sides of the San Joaquin Valley — will be either finished or under construction contract this year according to a recent announcement by Regional Director Richard L. Boke. Substantial progress will also be accomplished on the Tracy pumping plant (Dec., 1948, *Excavating Engineer*), virtual completion of work at Shasta and Keswick Dams, installation of all three electric generators at Keswick power plant and the last of five in Shasta's power plant. Given ample funds, which Mr. Boke said would most likely be forthcoming from the new Congress, Central Valley's initial works are all expected to

be in full time operation by the irrigation season of 1951.

To date Friant-Kern Canal is 43% complete. Of its 153 miles, 75 have been finished and 42 more are under contract, while contracts for the final 36 miles will be let this year. Delta-Mendota Canal, 20% finished, has 23 miles virtually completed, 51 more under contract and 69 to be contracted for. A third canal in the project, Contra Costa Canal was completed in 1948, with branch canals, pumping plant and transformer stations to serve Clayton and Ygnacio Valleys to be put into operation in 1949. Madera Canal is also completed.

Shasta Dam is 99% complete. Installation of the drum gates on the spillway crest, which will add 800,000 acre-feet of water capacity to the reservoir, and of river outlet valves in the dam was virtually completed in 1948 as was the construction of the highway from Summit City to the dam and the parking area at the site. Construction contemplated in 1949 will complete structure and facilities in the vicinity of the dam, permanent headquarters, and a 100 000-gal. water tank. Dismantling of the contractor's headtower will be completed, and reservoir clearing will continue on the Pit River.

Another dam in the project, Keswick Dam is 75% completed. The slots left in the spillway for river passage have been concreted, and construction begun on the gatehouse structure on the spillway crest of the dam. Friant Dam is 98% finished.

The Tracy Pumping Plant is 12% finished. A great deal of progress was made in 1948 and near completion of the building is expected this summer.

Kentucky Grants $16 Million In 1948 Road Contracts

The Kentucky Department of Highways contracted for 137 miles of new road construction and 1,177 miles of surfacing and resurfacing during 1948 at a cost of $16,467,000. The budget for the current fiscal year amounts to $39 million for maintenance and construction of 11,000 miles of state and rural highways.

A budget of $9 million was adopted last April to provide for maintenance which was the biggest problem because of the severe winter. Resurfacing contracts amounting to $4,800,000 were awarded, in addition to the department's own work to repair the damage done by the bad weather.

Rural construction in Kentucky saw one of its best years. Working with an appropriation of $5 million, the Rural Highway Division approved 12,874 miles of county roads for maintenance work and 549 miles for construction.

Thirty new bridges and 55 culverts were also added to Kentucky's bridge system. A major portion of the 1948 program provided for replacement of eight eastern Kentucky bridges in the Wolf Creek Dam area. The Wolf Creek bridge construction, expected to cost around $5 million, will be financed jointly by state and federal funds.

Among the major construction projects completed were 12 miles of concrete pavement on U. S. 27 in Harrison and Pendleton counties and the $500,000 overhead bridge and approaches in Rowan county. During the year, surveys and plans were completed on 351 miles of road at a cost of $375,000, or $1,068 per mile.

The $39 million budget for the current fiscal year brings to $13.70 the annual cost to each Kentucky citizen for road construction and maintenance (based on 1940 census of 2,846,000). Cost for each automobile and truck is $66.10 yearly, based on the 1948 registration of 590,000 vehicles. For every square mile of Kentucky's 40,000 square miles $975 is available for road purposes.

HOW TO SELECT A CLAMSHELL BUCKET

For best performance be sure to check

- Crane Capacity
- Work To Be Done
- Clearances
- Bucket Type and Size

The difference between peak and ordinary bucket performance depends on close observance of these basic factors.

Determine the *closing line pull;* also *size* of closing and holding cables. The *allowable gross load* is the closing line pull or the safe working gross load . . . *whichever is less.*

Consider *headroom clearance* and any other *space limitations.*

Determine the *character of the material* to be handled or excavated.

Then select the *type, size* and *weight* of bucket, and the proper *accessories* to make the bucket adaptable to your operations.

Blaw-Knox can best give you the engineering service that makes possible proper selection of the bucket suited for your needs.

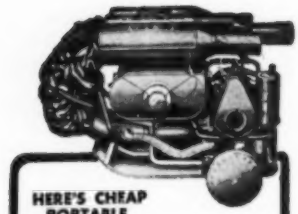
There are many practical and profitable suggestions on bucket performance and use in Catalog 2076. Send for your copy today.

BLAW-KNOX DIVISION of BLAW-KNOX COMPANY

Farmers Bank Building
Pittsburgh 22, Pa.

BLAW-KNOX CLAMSHELL BUCKETS

THE MOST COMPLETE RANGE OF SIZES AND TYPES



HERE'S CHEAP PORTABLE

HEAT FOR ALL

Portable Heaters expedite Winter work at small cost! Emergency heat for any purpose. **DRIES** concrete, plaster, grain, paint, lumber etc. **STARTS** cold motors, trucks, tractors, airplanes etc. **THAWS** frozen materials, plumbing, machinery and men.

These Stewart Warner war surplus pre-heaters produce 100,000 B.T.U.'s per hour on 1½ gallons gas and deliver same anywhere thru three long ducts. Starts like outboard motor. Order now...Supply limited. Spare parts available.

Enclose check or money order or send 1/3 deposit, balance C.O.D. with privilege of examination.

New and unused.	Rebuilt and test run
~~$630.00~~	~~$630.00~~
Now	Now
$295.00	$187.50
F.O.B.	F.O.B.

Quantity Discounts

KARL ORT

Department EE-2
YORK, PA.

New Equipment

Continued from page 34

recommended for use where highly corrosive conditions or elevated temperatures are encountered.

Haynes 92 rod is suitable for hard-facing massive parts where little or no preheating is practicable, and for thin sections, such as fan blades where the low fusion temperature minimizes warpage. It has also been used on the wearing edges of pug-mill paddles, increasing their service life 10 to 1. It is said that wear plates in shot blast machines hard-faced with this rod have outlasted unprotected plates by about 12 to 1.

Both Haynes 90 and 92 rods are supplied as bare rod for application by the oxy-acetylene process and coated electrodes for metallic-arc welding.

Mixer with Power Loader

Manufacturer: Muller Machinery Co., Metuchen, N. J.

Claims: A new 3½-S end discharge, non-tilting cement mixer, equipped with a power loader and automatic water measuring tank, has a large skip with a wide throat which, according to its maker, permits fast, clean discharge into mixer drum when loader is raised. The water tank is mounted on the discharge side to prevent moisture from clogging up the nose of the skip. It is also claimed that this mixer permits dumping from wheelbarrows directly into the loading skip.

Intercom Circuit

Manufacturer: Executone, Inc., 415 Lexington Ave., New York 17, N. Y.

Claims: A new intercom circuit which makes it possible to answer paged messages from high noise level areas clearly and intelligibly, according to claims, combines the coordinated operation of a trumpet-type paging reproducer and two-way staff station for use in either intercommunication or sound systems.

When the system is used to page a person in high noise level areas, the page message is reproduced at high volume through the trumpet station. To reply, the person called depresses a lever on the nearest conveniently located staff station. The trumpet is automatically cut out and two-way conversation at normal voice level can be carried on between the person paged and the originator of the call, it is said.

The trumpet reproducer, constructed of heavy gauge spun aluminum with

BIGGER PAYLOADS
with WELLMAN
Williams Type BUCKETS
• Exclusive features in design and construction make payloads bigger...at lower cost! Weight is balanced, not cumbersome. Extra strength is built into every part with the sturdy welded rolled steel construction pioneered by Wellman, the leader for over fifty years. A type for every service!
THE WELLMAN ENGINEERING COMPANY
7002 CENTRAL AVENUE • CLEVELAND 4, OHIO
SEND FOR BULLETIN

grey wrinkle finish, is 10½ inches in diameter and in overall length and is equipped with an adjustable mounting bracket. The die-cast metal staff station designed for mounting on wall or partition, is 6 inches wide, 6½ inches high and 3½ inches deep.

Hard Surfacing Powder

Manufacturer: Lincoln Electric Co., Cleveland 1, Ohio.

Claims: A hard surfacing powder, Surfaceweld A, to be applied with a carbon electrode, is used for depositing a thin chromium carbide type of hard surface highly resistant to abrasive wear and corrosion, according to claims.

Surfaceweld A is designed for surfacing applications where the use of hard surfacing electrodes is not always practical such as thin work, thin deposits and for use with small AC welders. The powder forms a paste when mixed with water which adheres to flat and curved surfaces.

It can be used with an AC arc with a single carbon electrode. It may also be applied with a twin carbon arc or may be used with DC, carbon electrode negative.

The hardness of the smooth dense deposit of Surfaceweld A is approximately 54-61 Rockwell C for one layer and 57-63 for multiple layers, hardness depending somewhat on the amount of admixture. The deposit develops full hardness in the as-deposited condition and maintains hardness and resists scaling at elevated temperatures.

The powder form of hard surfacing may be put to use on such jobs as maintaining the cutting edge of mixing blades, drill bits, surfacing augers, dipper teeth, bucket lips, forming dies, cement block formers, scraper blades and cableway drums.

Surfaceweld A is available packed in one pound cans.

Automatic Line Oiler

Manufacturer: Gardner-Denver Co., Quincy, Ill.

Claims: A new line oiler known as the L012 automatic line oiler, protects against running rock drills or other air-actuated equipment without adequate lubrication according to claims. This new device shuts off the line air automatically when all the oil in the reservoir has been used.

In operation, it is claimed the L012 automatic line oiler delivers a metered flow of atomized oil from any position, either vertical or horizontal and all of the oil is consumed. The flow of oil is metered so that any pneumatic equipment using from 25 to 500 cubic feet of air per minute can be lubricated. The oil capacity of the L012 line oiler is one pint, and the manufacturer states it is not necessary to shut off the line air, or to stop the machine to which it is attached, in order to refill the reservoir.

Track Roller Grease

Manufacturer: Pennsylvania Refining Co., 2686 Lisbon Road, Cleveland 4, Ohio.

Claims: A new special lubricating grease for truck wheels, track idlers and support rollers of Allis-Chalmers HD series tracktype tractors, known as Penn Drake A.C. track roller grease is reputed to possess good pumpability and cold temperature characteristics. It is also said that it is an extremely stable grease and will not deteriorate with long use.

Claims say it clings tenaciously and lubricates constantly without separation, despite exposure to weather, moisture and other extreme service conditions under which the Allis-Chalmers tractors operate. Besides containing an anti-oxidant, its base is a solvent-treated high viscosity index oil.

Dual Impact Action
DOUBLES PRODUCTION
with the
NEW HOLLAND
DOUBLE IMPELLER BREAKER
Anyone whose business involves stone-crushing knows that high production of uniform aggregates means savings. The Double Impeller Breaker does primary and secondary crushing in one fast operation. There is no grinding or crushing . . . just hard impacts to give clean cubical pieces. The same model breaker will produce as high as 60 percent fines, as low as 12 percent, by simple adjustments. Ask us.
T. Southworth
TRACTOR & MACHINERY CO.
GLENWOOD ROAD
ALBANY, NEW YORK
MENANDS, NEW YORK
TELEPHONE 5-5255

Make Your Choice

from

Six Bucyrus-Erie 4-Wheel Scrapers

◆ Investigate the new line of Bucyrus-Erie 4-wheel scrapers . . . six models to match the horsepower of International crawler tractors . . . six scrapers that combine big pay loads with fast cycles to produce low cost dirt . . . two types: B-type with front lift and S-type with rear lift. Ask your International Industrial Tractor distributor about the many features of these new scrapers. Select the size you need, put the scraper on your job — then watch the cuts go down fast! Bucyrus-Erie Company, South Milwaukee, Wisconsin.

BUCYRUS ERIE

◆ **FAST FULL LOADING** . . . Exclusive double-curve blade produces full loads quickly, distributes load evenly, lowers horsepower requirements for loading, breaks up chunks and reduces voids, loads more pounds of dirt per cubic yard.

◆ **FAST SMOOTH HAULING** . . . Scraper is pulled at drawbar level. Big low pressure tires, same size all around, stay on top even when going is soft. Rolling resistance is low because wheels are mounted on anti-friction bearings and flotation is equalized.

◆ **FAST STABLE TURNING** . . . High-streamlined gooseneck and ample distance between front post and bowl frame provide plenty of clearance for front tires. Low center of gravity provides exceptional stability. Low fairlead sheaves eliminate tendency to tip the scraper over with winch lines.

◆ **FAST CLEAN DUMPING** . . . Exclusive two-section apron can be adjusted to provide opening that suits material being loaded. Positive rolling ejection gets rid of load fast. Exclusive torque-rod speeds return of bowl to loading position.

B-250
22 cubic yards (struck)

◆

B-170
15 cubic yards (struck)

◆

S-113
10 cubic yards (struck)

◆

S-91
8 cubic yards (struck)

◆

S-68
6 cubic yards (struck)

◆

S-46
4 cubic yards (struck)

121T48C

See Your INTERNATIONAL

for Low Cost Dirt
B-170
B-TYPE 15 and 22 Cubic Yard
BUCYRUS ERIE
S-TYPE ♦ 4 to 10 Cubic Yard
Industrial Tractor Distributor

SAUERMAN
Long Range Machines

Make Dirt Fly on Tough Jobs

On thousands of varied dig-and-haul jobs, SAUERMAN Machines are piling up profits for their owners. Because of their long operating range, great digging power and fast haulage speeds, these machines are able to handle many difficult jobs below the engineers' estimates.

Above is a typical example. Here a 500-ft. span SAUERMAN Scraper (with the scraper hoist mounted on a skid-frame) is being used to drag gravel from bed of river and build a sloping revetment. The river was deepened to grade and the eroded bank repaired in the same operation. Hourly yardage moved into place averaged about 130 cu. yd. at a cost around 5c a yard.

SAUERMAN Scrapers and Cableways are adaptable to almost any ground conditions. The operator has finger-tip control of the entire cycle of digging, hauling and dumping. Power consumption is low. Maintenance is simple.

Write for Catalog and engineering advice on your problems.

SAUERMAN BROS., INC.

574 S. CLINTON ST. CHICAGO 7, ILL.

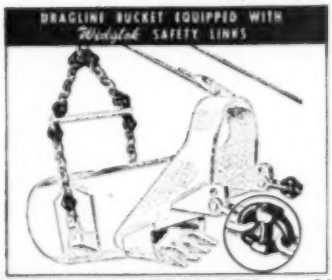
EASY TO ASSEMBLE

Wedglok

PATENTED

SAFETY CONNECTING LINKS

A vastly improved connecting link that combines safety with unique simplicity. Its strength exceeds the published strength of comparable alloy chain . . . assembles rapidly without the use of special equipment.



The ease of assembly makes WEDGLOK particularly useful for dragline buckets, slings and other equipment or machinery requiring the attachment of chain or wire rope. Produced in both regular and pear shape. Sizes ⅜" to 2½".

Write for price list and data sheet.

SAFETY • STRENGTH • SIMPLICITY • ENDURANCE

A PRODUCT OF

INTERSTATE DROP FORGE CO.

4077 N. 27TH. ST. MILWAUKEE 9, WISC.

New trade literature

Title: **Pile Hammer Bulletin**
Subject: Revised specifications and an added listing of component parts for all sizes of a line of single-acting hammers are included in this new release. The text explains special uses, gives operating instructions.
Where to Get: McKiernan-Terry Corp., Dept. EE, 15 Park Row, New York 7, N. Y. (Free)

Title: **Bulletin on Macadam Base**
Subject: A 16-page booklet, "Macadam Base Construction Methods," is amply illustrated with easily understandable instructions. It points out the difficulties of even distribution and leveling of crushed stone and other aggregates and how they can be overcome.
Where to Get: Seaman Motors, Inc., 305 N. 25th St., Milwaukee 3, Wis. Ask for Bulletin 60. (Free)

Title: **Wire Rope Film**
Subject: "Indian Paint," a 4-color sound film, shows the making of steel from ore to the finished product—wire rope. It runs 35 minutes.
Where to Get: Colorado Fuel and Iron Corp., Wickwire Spencer Steel Division, Palmer, Mass. (No charge)

Title: **Reclamation Information**
Subject: Issued by the Department of Interior, this 24-page book in three colors explains the needs for reclamation in various parts of the country, results achieved by reclamation programs, and the possibilities of further development.
Where to Get: Division of Information, Bureau of Reclamation, Region I, Boise, Idaho. Ask for "The Reclamation Program."

Title: **Hoisting Machinery Bulletin**
Subject: General specifications and data of standard and special equipment in the hoisting machinery field are included in this new 20-page 2-color bulletin.
Where to Get: Superior-Lidgerwood-Mundy Corp., Superior, Wis. (Free)

Title: **Steel Sheet Piling Brochure**
Subject: This brochure contains five cross sectional views, with dimensions of light-weight interlocking corrugated sheet steel piling. A physical characteristics chart and suggested applications are also included.

Where to Get: L. B. Foster Co., Chicago 4, Ill. Ask for folder F-110A. (Free)

Title: **Arc Welding News**
Subject: In the 24 pages of this booklet are photographs and articles on various specific applications of arc welding throughout the country.
Where to Get: Hobart Brothers Co., Troy 1, Ohio. (Free)

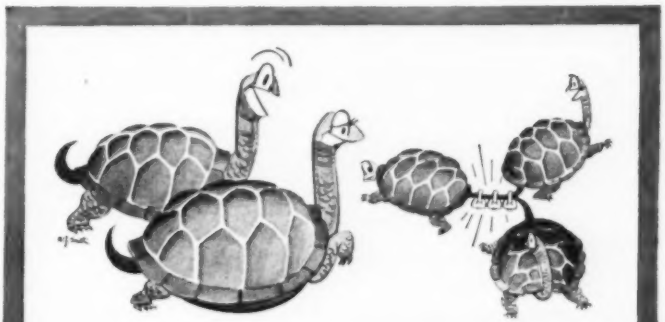
Title: **Welding Products Catalog**
Subject: A new 12-page catalog illustrates a complete line of electrode holders, ground clamps, cable connectors, cable splicers, terminal connectors, cable lugs and carbon electrode holders. Quantity price schedule and parts information are included as well as material on the maintenance and care of electric welding cables, connections, grounds and holders.
Where to Get: Tweco Products Co., P. O. Box 666, Wichita, Kans.

Title: **Highway Research Report**
Subject: This report, issued by the Highway Research Board, is the result of a survey of pumping of concrete pavements in Illinois. About 300 miles were studied in the area around Chicago. All data, observations and conclusions are included.
Where to Get: Highway Research Board, National Research Council, 2101 Constitution Ave., Washington, D. C.

Title: **Tractor, Grader Bulletins**
Subjects: "Clearing for Action" shows clearing methods for reclaiming productive agricultural land, construction sites, mine and quarry operations, housing projects and applications in the export field. "Building and Maintaining State, County and Township Roads" gives suggestions for handling all types of road work from heavy construction to fine maintenance, from summer ditching to winter snow removal with diesel motor graders.
Where to Get: Caterpillar Tractor Co., Peoria 8, Ill. "Clearing for Action" bulletin available by asking for Form 11796; the motor grader bulletin, Form 11799. (Free)

Title: **Metal Pipe Bulletin**
Subject: The advantages of flexible paved corrugated metal pipe in re-

Continued on page 64



They used to keep turning turtle, until we hitched them up with Crosby Clips!

9903

Fasten wire rope with CROSBY CLIPS. Safe, simple, speedy . . . applied anywhere by one man with one wrench. *Drop-forged*, not cast. Hot dip galvanized. All sizes . . . for ⅛" to 3" wire rope. Distributors everywhere; made only by AMERICAN HOIST AND DERRICK CO., St. Paul 1, Minnesota.

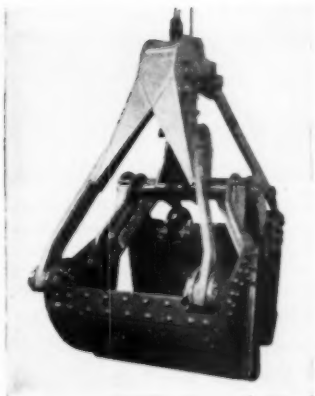
ALSO MAKERS OF THE AMERICAN HANDIWINCH AND AMERICAN BLOCKS AND SHEAVES

Industry buys more

CROSBY CLIPS

than all other drop-forged fasteners!

ERIE BUCKET CATALOG *Shows*



Gross Loads for 43 Standard 2-Line Buckets in 9 Materials

Write for a copy of Catalog 2L-2. Compare your present bucket performance to see if you are getting the most from your crane. Or send us size and make of crane and materials handled, giving present bucket output. We'll give you Erie's proved bucket performance for your crane.

Erie makes 4 standard types of 2-line buckets in 43 sizes.

ERIE

STEEL CONSTRUCTION COMPANY

492 GEIST ROAD • ERIE, PENNSYLVANIA

Notes from the manufacturers

R. G. Le Tourneau, Inc., Peoria, Ill., recently appointed four new district sales representatives. Steve A. Batorson, with offices at Syracuse, N. Y., will serve northeastern United States and eastern Canada, assisting LeTourneau distributors located in New York, Connecticut, Rhode Island, Massachusetts, Vermont, New Hampshire and Maine, in New Brunswick, Nova Scotia, New Foundland and New Foundland Labrador and Prince Edward Island in Canada. Fran W. Duke will be district representative for distributors in lower New York state, upper New Jersey, Pennsylvania and Maryland. M. B. (Jack) Crowley will serve Virginia, West Virginia, North and South Carolina. His offices will be at Raleigh, N. C. Named district sales representative for the states of Oklahoma, Arkansas, Mississippi, Louisiana and western Tennessee is Jim Sevick.

Osgood Co. and **General Excavator Co.,** Marion, Ohio, announce the appointment of William S. Hawkins as division sales manager for Texas, Oklahoma, Kansas, Missouri, Iowa and part of Nebraska. He will maintain offices at Topeka, Kans.

Caterpillar Tractor Co., Peoria, Ill., has named three additional assistant divisional parts managers. The appointees are T. A. Dunne in the Eastern division, J. E. Ferguson in the Central division and W. R. Owens in the Western division.

The Euclid Road Machinery Co., Cleveland 17, Ohio, announces that Thomas A. Cantrell, formerly field engineer in its sales development department, has been appointed district manager for western New York and the Canadian Provinces of Ontario and Quebec.

Diesel Engineer Manufacturers Association at the annual meeting in December elected as vice-president and treasurer, Robert H. Morse, Jr., vice-president in charge of all operations of Fairbanks, Morse and Co. Elected as vice-presidents were A. W. McKinney, executive vice-president of National Supply Co., and O. H. Fischer, president of Union Diesel Engine Co. New directors are these three men and George W. Codrington, vice-president of General Motors Corp. and general manager of Cleveland Diesel Engine division; Perry T. Egbert, vice-president in charge of diesel and locomotive sales, American Locomotive Co.; Robert E. Friend, president of Nordberg Manufacturing Co.; Gordon Lefebvre, president of Cooper-Bessemer Corp.; Walter A. Rentschler, vice-president of Lima-Hamilton Corp.; E. J. Schwanhausser, vice-president in charge of sales, Worthington Pump and Machinery Corp., and Marvin W. Smith, executive vice-president of Baldwin Locomotive Works.

Hewitt-Robbins, Inc., New York 17, N. Y., announces the appointment of Bernard H. McGuiness, three years works manager of the Passaic, N. J., plant, as vice-president of the Conveyors division. McGuiness, who joined the company in 1923, was for many years general superintendent of installation in that division. He was in charge of field crews who installed belt conveyors and other materials-handling machinery at coal, ore, diamond and copper mines, rock quarries and industrial plants throughout the world.

Cardoz Corp., Hardscog Division, Chicago, Ill., has announced the appointment of W. P. and R. S. Mars Co., Duluth, Minn., as its distributor of horizontal and vertical earth drills as well as related drilling equipment. The Mars Co., besides covering the Minnesota iron range, also covers the northern counties of Wisconsin and Michigan's upper peninsula.

Byers Machine Co., Ravenna, Ohio, has appointed John F. Van Way as Midwest district sales manager with offices in St. Louis, Mo. R. E. Boehck, formerly district sales manager in the Midwest and Southwest, will now concentrate in the Southwest territory with headquarters at Houston, Tex.

DREDGES

HYDRAULIC
DIPPER
CLAMSHELL

Bolted sectional steel hulls for landlocked, inland waters

If you need a dredge, write us!

AMERICAN STEEL DREDGE CO. INC.
FORT WAYNE 1 · INDIANA · U.S.A.

DESIGNERS AND BUILDERS OF DREDGING EQUIPMENT SINCE 1905

More Dirt Moves Faster When
OWEN BUCKETS
swing over dump trucks

This claim is strongly substantiated by the increasing numbers of excavating contractors who have standardized on Owen Buckets to "Insure a Bigger Day's Work".

Long popular, Owen design and construction characteristics make for consistent "ease of operation" with "A Mouthful at Every Bite" and a clean and rapid discharge.

THE OWEN BUCKET CO. 6895 Breakwater Ave., Cleveland, O.

BRANCHES: PHILADELPHIA • CHICAGO • BERKELEY, CALIF.

A MOUTHFUL AT EVERY BITE

TO ADVERTISE: All advertising in this section is payable in advance. Rate: 60c per line, or $7.20 per inch of 12 lines. Minimum charge $2.40. No discounts; no commissions. Please count your copy carefully to avoid delay. Each line contains 41 characters (34 characters if all capital letters are used). Count spaces and punctuation as one character each. Allow 10 characters for box number, if blind advertisement is desired. Be sure to enclose the correct amount of money with your order. Closing date — 15 of preceding month. Example: January closes December 15th.

TO INQUIRE: Be sure to address your inquiry to the advertiser by using the correct box number. Mail your letter in care of Excavating Engineer, South Milwaukee, Wisconsin. Write each advertiser a separate letter. Do not write us for name and address of advertiser. This information will not be given out. We have no information about the equipment advertised other than that shown in the advertisements themselves.

Monighan 2-W diesel dragline, 70 foot boom, 2-¾ yd. bucket, 85 hp Fairbanks-Morse engine. Location Middlewest. Box 3308

One Bucyrus-Erie Model 78-C, Serial No. 4348, steam powered, crawler mounted shovel with 3-yard cast dipper also extra dipper, needs boiler work and hoist chain, balance machine good condition. Located Central Texas. Box 3305

Monighan 2-W diesel dragline, 70' boom, 2-½ yd. bucket. Recently overhauled. Central location. Box 3310

Northwest 95 3-yd. dragline. Shovels 1; 1¼; 1½ yd. Northwest No. 6; 5-W Monighan.
A. W. Nevers **Mt. Pleasant, Iowa**

FOR SALE
2½-yd. P & H Electric Shovel, Model 1225

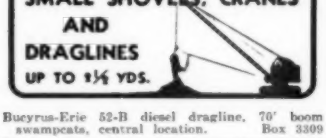
This shovel has a 3-yard bucket and is in very good mechanical and electrical condition.

Shovel can be demonstrated under power.

Electrical equipment: 3 phase, 60 cycle, 2300 volts.

Good selection of new parts to be sold with shovel.

JOHNS MANVILLE PROD. CORP.
Lompoc, California



Bucyrus-Erie 52-B diesel dragline, 70' boom swampcats, central location. Box 3309

Bucyrus-Erie 10-B shovel, dragshovel and dragline. Also Bucyrus-Erie 10-B shovel, dragshovel, dragline without bucket or fairlead. Box 3296

2—50-B steam shovels for sale. For particulars write:
New York Trap Rock Corporation
230 Park Avenue **New York City 17, N. Y.**

USED 18" OR 20" ELECTRIC HYDRAULIC DREDGE. MID-WESTERN LOCATION. BOX 3251

1—Model 10-B Bucyrus-Erie gas shovel with DL and hoe—reconditioned.
1—22-B Bucyrus-Erie late model shovel—Buda gas powered—slightly used.
1—Slightly used shovel front end equipment for Bucyrus-Erie 22-B.
CLYDE EQUIPMENT COMPANY
3410-1st Ave. South **Seattle 4, Wash.**

New Dragline Buckets

2-1¼ cubic yard Red Arch, Type AX medium duty bucket.
3 cubic yard Red Arch, Type AY heavy duty bucket.
5 cubic yard Red Arch, Type AY heavy duty bucket.
6 cubic yard Red Arch, Type AY heavy duty bucket.

Bucyrus-Erie Company
Parts Division
South Milwaukee, Wisconsin

Gar Wood 400 scraper 12 yd. $1850. Others 2 to 4 yd. $650 to $950.

PUSH DOZER. LaPlant Choate, heavy duty for TD18 or equal. Shock mounted $300.

LOW BED Fruehauf trailer, 8 tires rear 900x20 with dolly on 1200x20. Deck is 22'x9'6". Air brakes. Perfect. $1250.

ANGLE MOULDBOARDS. Le Tourneau WCK7 for D7 or D8 tractors. Like new. $300.

WIRE ROPE, improved plow steel, IWRC sizes ⅝" and ⅞" price delivered. 16c to 22c.

TIRES, good scraper and grader spares $65.

MACHINERY PAINT AND ENAMEL, best quality yellow, black or gray. 5 gallons for $12.50.

WATER PIPE, 4" redwood or fir for mine drainage, etc. 86 lb. pressure. Per ft. 30c.

G. W. Kaufman
R.R. No. 8 Markley Road **Cincinnati 30, Ohio**

Owner's Offering
(Subject to Prior Sale)

Located at St. Paul, Minnesota:
1—52-B Bucyrus-Erie diesel crane-dragline-shovel combination.
1—Robins Gyrex 4'x10' double-deck vibrating screen.
1—LeRoi 6-cyl. 160 hp gasoline power unit.
1—Model 50 Caterpillar tractor, diesel, with 10' bulldozer.
Located at St. Cloud, Minnesota:
1—14" Superior McCully gyratory crusher.
1—10" Superior McCully gyratory crusher.
J. L. SHIELY COMPANY
1101 N. Snelling Avenue **St. Paul 4, Minn.**

One model 70, ¾-yard Buckeye gasoline powered shovel, excellent condition, Serial No. 4427, (f.o.b. cars Portland, Oregon) $9850
One used 3-cu. yard Esco manganese dragline bucket, good condition $1250
One ¾-yard Unit—shovel, hoe and dragline, practically new $15,000
One ¾-yard Bucyrus-Erie 10-B shovel, rebuilt, excellent condition $6750
Clyde Equipment Company
1631 N.W. Thurman Street **Portland, Oregon**

Bucyrus-Erie No. 8 bit dresser. Complete and in perfect operating condition. Located in Washington State. Box 3271

FOR SALE: Nordberg 1250 HP diesel-electric generating units (2), G.E.-Westinghouse, 1060 KVA, 3-60-2300 v., 180 rpm, heavy duty, factory warranted, A-1.

WANTED TO BUY

Locomotives (3), 10 to 30 tons, gas or diesel, Plymouth preferred, any condition or gauge. Quote with details.
H. Y. Smith Co., 828 N B'way, Milw. 2, Wis.

Cletrac type DG with Hercules RXC gasoline 60 hp engine and Heil bulldozer, hydraulic control. No operating time since last major overhaul which included new tracks. Location—Washington, D. C.—West Bros. Brick Co., 719 15th St. NW, Washington 5, D. C.

One Bucyrus-Erie 29-T blast hole drill with approximately five years' service; suitable for drilling 6" to 10" diameter holes with 38' steel derrick, full caterpillar mounting and built-in tool wrench. Can be offered with either electric motor for 3 phase 60 cycle, 440 volt power or with gasoline engine drive. Drill in A-1 condition and priced reasonable for immediate delivery. Located in Ohio. Box 3298

One Pioneer 4209 crushing unit, complete with 40" x 22" roll crusher with hopper 30" x 16', rubber belt conveyor, chain driven, brakes, wheels and axles, 100 H.P. motor recommended. Maximum crushing size 3", minimum crushing size 1¼", tons/hr. at 3" size — 291, tons/hr. at 1¼" size — 45. Crusher in A-1 condition and priced reasonable for immediate delivery. Located in Ohio. Box 3302

MECHANICS — HOME STUDY. Step up your own skill with facts and figures of your trade. Audels Mechanics Guides contain Practical Inside Trade Information in handy form. Fully illustrated. Easy to Understand. Highly endorsed. Check book you want for 7 days' Free Examination. Send no money. Nothing to pay postman. ☐ Carpentry $6. ☐ Auto $4. ☐ Oil Burners $1. ☐ Sheet Metal $1. ☐ Welding $1. ☐ Refrigeration $4. ☐ Plumbing $6. ☐ Masonry $6. ☐ Painting $2. ☐ Radio $4. ☐ Electricity $4. ☐ Mathematics $2. ☐ Steam Engineers $4. ☐ Machinist $4. ☐ Blueprint $2. ☐ Diesel $2. ☐ Drawing $2. If satisfied you pay only $1 a month until price is paid.
AUDEL Publishers
49 W. 23 St. **New York 10, N. Y.**

Organization or individual possessing excavating and grading equipment, by newly organized contractor with plenty of "know how.". Partnership on job basis desired. N.Y.C. Box 3311

WANTED: One 8-cu. yd. caterpillar steam shovel with boom not less than 80 feet. Dr. A. C. Daudt, c/o Ulen Management Company, 120 Broadway, New York 5, New York.

WANTED: High Lift shovels for coal stripping. Box 3284

HELP WANTED

WANTED: In vicinity of Boston, Mass. Assistant Superintendent for sand and gravel plant who knows machinery and capable of handling men. State references and availability. Box 3313

Continued on page 64

Help Wanted

Continued from page 63

Construction Superintendent

For West Virginia coal operator. Broad experience necessary to supervise all outside construction work including setting ventilating fans, building and maintaining mountain roads, constructing narrow gauge railroad track, building concrete block and steel buildings, etc. This is a permanent position with a secure future. Box 3306

Sales Representatives — Earth Moving Equipment

Large middle western manufacturer of allied equipment for crawler tractors (bulldozers, hauling scrapers) requires sales representatives with sales or construction experience for work in Northeastern U. S. and Eastern Canada; also Pacific Northwest and adjacent Canadian Provinces. Prefer ages 28 to 35. Work consists of sales contacts with distributors of heavy construction equipment and crawler tractors. Positions afford possibilities of permanent employment and advancement with ability and accomplishment. Reply should include age, educational background, experience and family status. Box 3303

Superintendent Wanted

By contractor in New York area. Must be experienced in both building and heavy construction work. Immediate job is one of about three years' duration, located in the Great Lakes area, but the right man can count on continuous employment. Must have good record with reputable contractors in order to be considered for this opening. Box 3307

POSITIONS WANTED

Gen. supt. or supt. available. Experience covers 25 years supervising, estimating and building all classes of excavating; railroads; highways; airports; earth-fill dams. Honest, sober, reliable. Best of references. Salary open. Box 3304

Position wanted as shovel operator. Can operate any make of machine; shovel; dragline; clamshell, or crane. Steam, gas, diesel or electric. Large or small machines. Box 3312

Houston

Continued from page 25

varying from 15 to 25 feet at the bottom and 225 feet across the top. Two 2-yd. Northwest 6 draglines with 50-ft. booms excavated the center section, loading to Caterpillar DW-10's with bottom dump bodies. Excavated material was used as fill, spread by an Allis-Chalmers HD-19 with a Gar Wood dozer and two Caterpillar D-8's.

Two larger draglines, a 3-yd. Bucyrus-Erie 54-B and a 3-yd. Northwest 95, both with 80-ft. booms, followed the 6's, trimming the side slopes (which are 3 to 1) and cutting the bottom to finished grade. Aubrey E. Kimball, McGinnes' superintendent, directed the job.

Spend Nearly $10 Million

Much of the 24,700 acres of land purchased for right-of-way and reservoir construction by the Corps of Engineers, directing the overall project, will be leased for grazing and farming purposes. Nearly $10 million have already been spent on the entire project by the Corps including $2,900,000 furnished by the Harris County Flood Control District.

Project engineer supervising work on the job for the Corps is Norman W. Brown.

"We'll have to retrieve McStoop at the corner saloon again, I see!"

New Trade Literature

Continued from page 61

sisting corrosion, erosion, shearing and other damage is described in technical terms with typical applications and engineering data

Where to Get: H. E. Arnsby, United Steel Fabricators, Inc., Wooster, O.

Title: **Scraper, Dozer Broadsides**

Subject: Two new broadsides, describing the "B" Tournapull and the "B" Tournadozer, have been issued containing complete specifications, large illustrations and comprehensive explanatory material.

Where to Get: R. G. LeTourneau, Inc., Peoria, Ill., or any LeTourneau distributor. Ask for the Tournapull Broadside, TP-163, or the Tournadozer, TD-119 (Free).

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Wm. O. Hensley Truck Parts, P.O. Box 747, Phone Crawford 3734, 904 Poplar St., Terre Haute, Ind.

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..... GMC 2½ ton 6x4 or 6x6 Banjo Type Axle

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..... Studebaker or Reo 2½ ton 6x4 or 6x6

..... International M-5H-6 2½ ton 6x6

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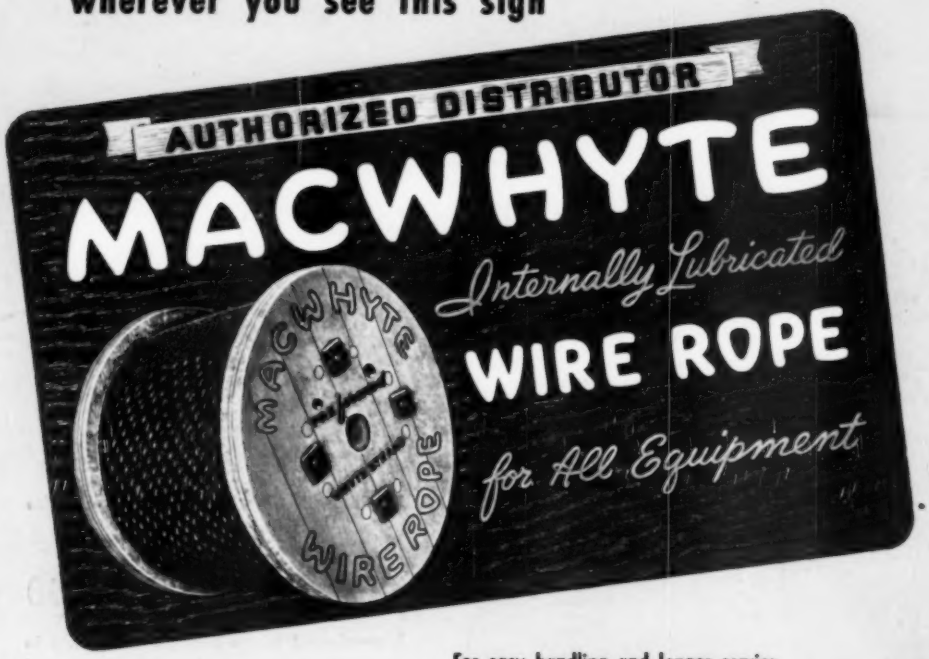

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